Concept 1 Devices and Energy

1 Summary of Concept 1

Battery

1. It is the source of energy for remotely-controlled toys.
2. It stores chemical energy inside it.
3. When a battery runs out (exhausts), it must be recharged or replaced with a new one.
4. It produces electrical energy.

Energy change inside a toy car:

Chemical energy (stored in the battery) → changes into → electrical energy → changes into → kinetic energy and sound energy

Mars Curiosity Rover:



1. It is a robotic vechile that explores Mars.
2. It is operated remotely from a distance.
3. It uses solar panels to get the electrical energy needed to recharge its batteries.
4. It takes about 6 months or more to reach Mars, as Mars is about 54 kilometers away from Earth.

Energy and devices:

1. Not all the energy in the energy chain reaches the device.
2. Some produced energy doesn't help the device do its function, and it's called "lost energy".
3. Most of the lost energy in a device leaks out in the form of heat.
4. The amount of energy that enters a device must be equal to the amount that comes out of it.

Law of Conservation of Energy

Energy is neither created nor destroyed; it can only be converted from one form to another.

Device	Consumed Energy (Input Energy)	Produced Energy (Output Energy)
• Hair dryer	Electrical energy	Thermal energy Sound energy Kinetic energy
• Blender (mixer) • Washing machine • Vacuum cleaner	Electrical energy	Kinetic energy Sound energy
• Television • Mobile phone	Electrical energy	Light energy Sound energy
• Electric fan	Electrical energy	Kinetic energy
• Electric iron • Kettle (boiler)	Electrical energy	Thermal energy
• Soap dispenser	Potential energy (Stored in the spring)	Kinetic energy (Movement of the soap upward)

Device	Consumed Energy (Input Energy)	Produced Energy (Output Energy)
• Hand bell • Drum • Guitar	Kinetic energy	Sound energy
• Radio • Door bell	Electrical energy	Sound energy
• Remote-controlled car	Chemical energy	Kinetic energy Sound energy
• Battery-powered clock	Chemical energy	Kinetic energy
• Flashlight	Chemical energy	Light energy Thermal energy
• Electric bulb (lamp)	Electrical energy	Light energy Thermal energy

	Output Energy	
Device	**Energy that helps the device do its function**	**Lost Energy** (doesn't help the device in its function)
• Hair dryer	Thermal energy	Sound energy
• Blender • Washing machine	Kinetic energy	Sound energy Thermal energy
• Mobile phone • Television	Light energy Sound energy	Thermal energy
• Remote-controlled car	Kinetic energy	Thermal energy

Energy chain:

- **Energy chain** is the path of energy from the Sun to different devices.
- Each energy chain starts with the **Sun**.
- The Sun is the main source of energy on Earth.

Examples of Energy Chains

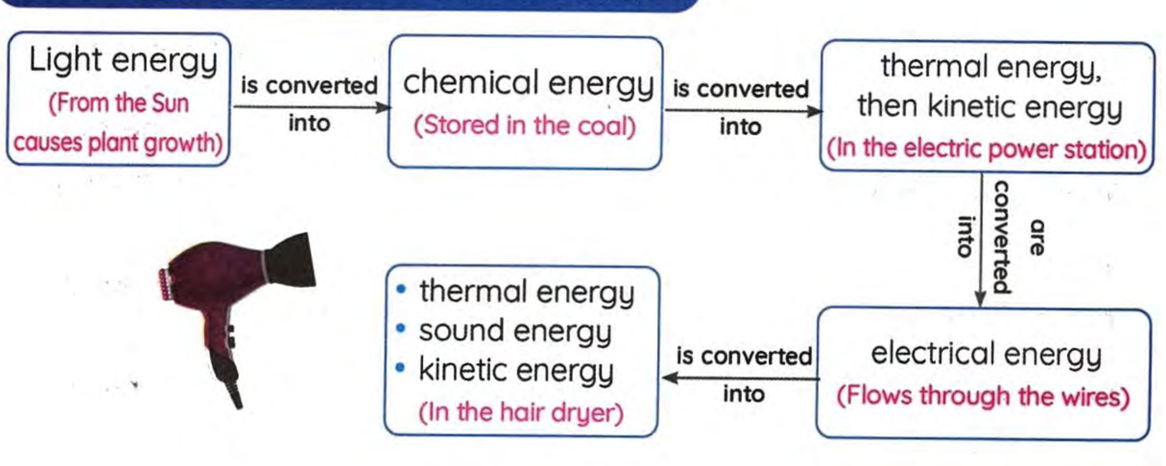
① Energy chain when eating food:

Light energy (From the Sun) → is converted into → chemical energy (Stored in the plant then in the human body) → is converted into → kinetic energy (Allows the body to move)

② Energy chain when heating a pot of water over a fire:

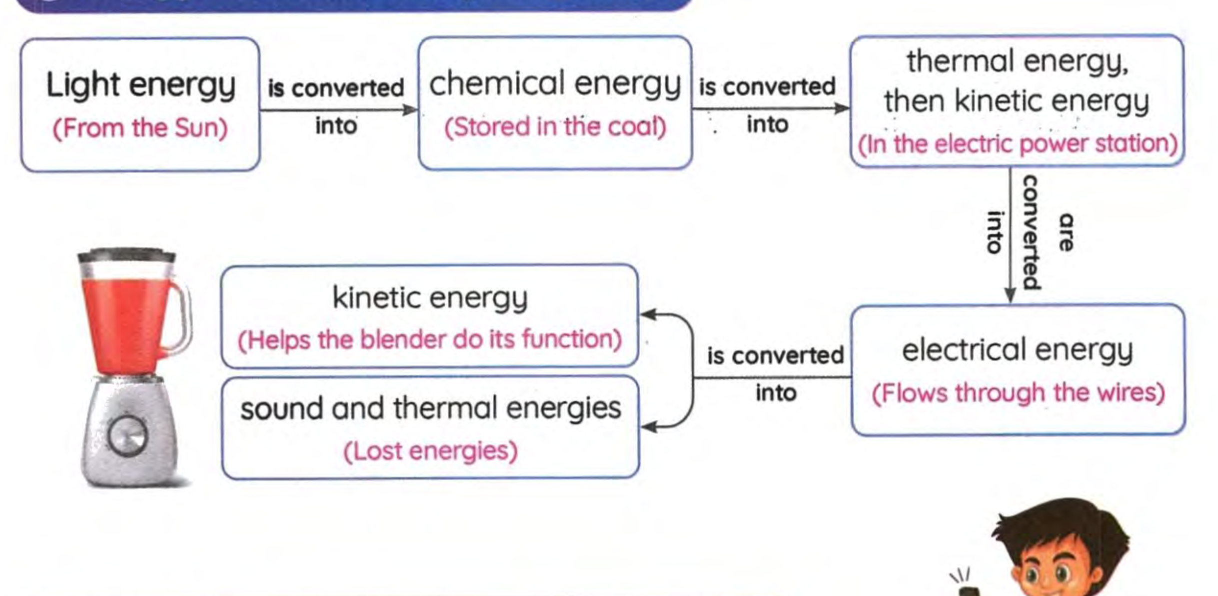
Light energy (From the Sun causes plant growth) → is converted into → chemical energy (Stored in the wood of plants) → is converted into → thermal energy (Released on burning the wood)

③ Energy chain when using the hair dryer:

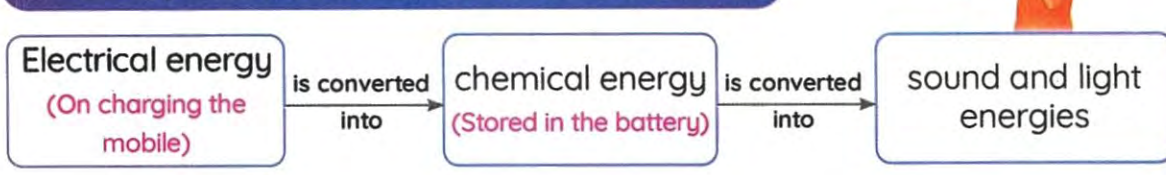




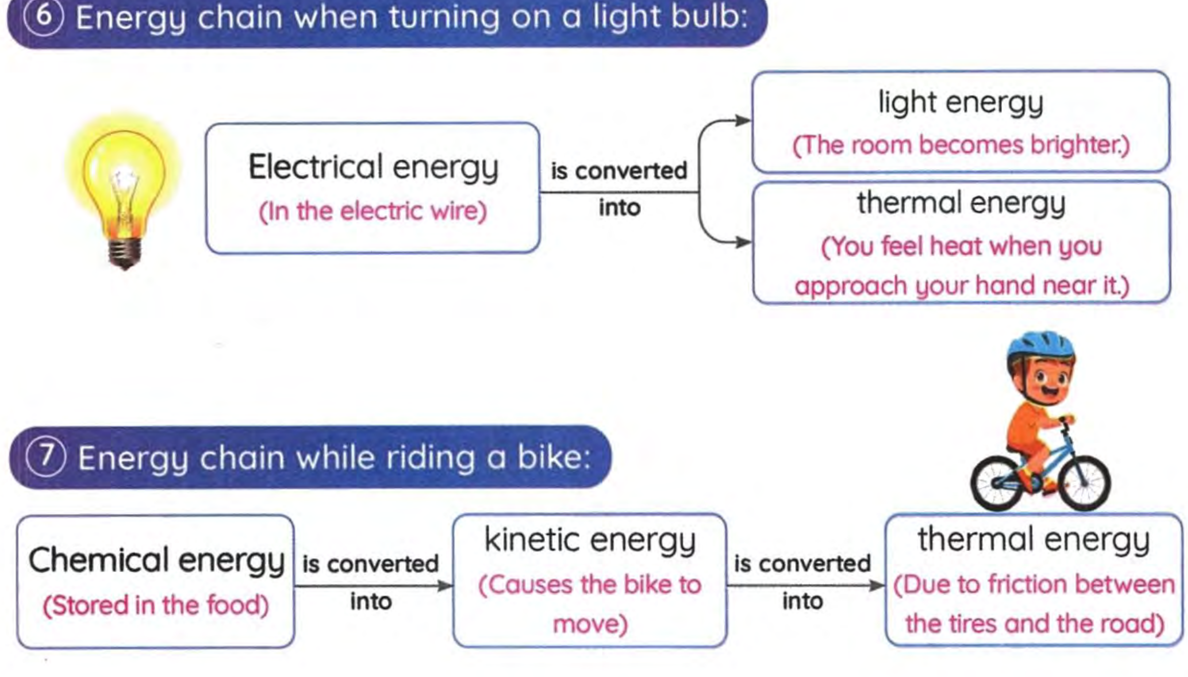
④ Energy chain when using the blender:



⑤ Energy chain when using the mobile phone:



⑥ Energy chain when turning on a light bulb:



⑦ Energy chain while riding a bike:

2 Definitions of Concept 1

Chemical energy	• It's a form of energy stored in the battery. • It's a form of energy stored in the human body.
Curiosity Rover	It's a robotic vehicle that can be controlled from a distance and is used to explore the surface of Mars.
Solar panel	It's a tool that converts solar energy into electrical energy in Mars Rover.
Input energy	It's the energy consumed in the device.
Output energy	It's the energy produced from the device.
Lost energy	It's the energy produced by the device that doesn't help it perform its function.
Energy chain	It is the path of energy from the Sun to different devices.
The Sun	It's the main source of energy for most forms of energies on Earth.
Thermal energy	• It's the energy produced when the wood of trees is burned. • It's the energy that is always produced due to friction. • It's the energy lost while using a computer.
Sound energy	It's the energy produced from playing the guitar or drums.
Light energy	It's the energy that helps a light bulb do its main job.
Electrical energy	It's the energy that flows in wires until it reaches the devices.
Copper	It's the material from which electric wires are made.
Law of Conservation of Energy	Energy is neither created nor destroyed; it can only be converted from one form to another.

3 Give Reasons for... Concept 1

1 **All toys operated remotely need energy.**
- To move and do tasks, such as turning corners or moving their arms.

2 **After a while of operating a toy car, it stops.**
- Because the batteries are exhausted.

3 **The batteries used in the toys cannot be used to charge the Curiosity Rover.**
- Because Mars Curiosity Rover is very far from any store or any plug.

4 **Any energy chain starts with the Sun.**
- Because the Sun is the main source of energy.

5 **Energy is conserved.**
- Because energy is neither created nor destroyed; it can only be converted from one form to another.

6 **Not all the energy that enters the device reaches it.**
- Because some of the input energy escapes into other forms that the device does not use.

7 **During running, there is a change of energy that takes place inside your body.**
- Because the chemical energy stored in the food is converted into kinetic energy that helps your body move.

8 **When burning some wood from trees, there is a change in energy.**
- When the wood from trees is burned, the chemical energy stored in the wood is converted into thermal energy.

9 **When you touch an electric lamp, you feel heat.**
- Because electrical energy changes into light and heat energies.

10 **Thermal energy is considered a wasted material in some home devices.**
- Because thermal energy doesn't help some devices do their main jobs.

4 What Happens if...? Concept 1

1. A toy car is operated remotely?
   - The chemical energy stored in the batteries changes to electrical energy and then to kinetic energy to move the toy car.

2. The batteries of a toy car are exhausted?
   - The toy car stops moving.

3. An electric bulb is operated?
   - Electrical energy changes into light and thermal energies.

4. An electric fan is operated?
   - Electrical energy changes into kinetic energy.

5. You rub your hands?
   - Kinetic energy changes into thermal energy.

6. The bike rider pushes the paddles with his legs?
   - The chemical energy stored in his body changes into kinetic energy.

7. You approach your hand to a light bulb?
   - I will feel the heat of the lamp.

5 Revision on Concept 1

1 Choose the correct answer:

1. Most toys depend on .... as a source of energy.
   a. water b. batteries c. fuel d. food
2. Batteries store .... energy inside them.
   a. chemical b. electrical c. solar d. kinetic
3. Curiosity Rover is designed to explore ....
   a. the Sun b. the moon c. Mars d. Earth
4. .... is considered the main source of energy on the Earth's surface.
   a. Fuel b. The moon c. The Sun d. A battery
5. Some energy is lost in most devices in the form of .... energy.
   a. electrical b. thermal c. sound d. kinetic
6. Electric wires are made up of ....
   a. plastic b. wood c. iron d. copper
7. The input energy in Curiosity Rover is .... energy.
   a. thermal b. solar c. electrical d. kinetic
8. All of the following store chemical energy, except ....
   a. a battery b. an apple
   c. a compressed spring d. coal
9. All the following devices produce thermal energy, except the ....
   a. hair dryer b. watch c. kettle d. electric heater
10. The .... uses thermal energy to do its function.
    a. mobile phone b. washing machine
    c. TV d. hair dryer
11. The produced .... energy doesn't help the blender do its job.
    a. sound b. thermal c. chemical d. potential

12 When you turn on your television, the electrical energy travels through the .... until it reaches it.

a. wires b. air c. screens d. plastics

13 During riding a bike, some kinetic energy is converted into .... energy due to the friction of the bike's tires with the road.

a. chemical b. potential c. thermal d. electrical

14 During charging a mobile phone, the .... energy is stored in the battery as .... energy.

a. chemical - electrical b. electrical - chemical
c. electrical - sound d. chemical - light

15 All the following are from the consumed or produced energies in the mobile phone, except the ....

a. chemical energy b. light energy
c. sound energy d. potential energy

2 Put (✓) or (✗):

1 Mars Rover and toy cars can be operated from a distance. ( )

2 Mars is located a few kilometers away from Earth. ( )

3 It takes several days for a spacecraft to reach Mars. ( )

4 Most energy chains start with the moon. ( )

5 The energy chain of a burning candle is composed of chemical energy converted into thermal energy and light energy. ( )

6 Energy can't be transformed from one form to another. ( )

7 Both the electric bulb and the electric heater produce thermal energy. ( )

8 When you rub your hands, kinetic energy changes to heat energy. ( )

9 The produced sound energy helps the blender do its function. ( )

10. There is energy loss when energy is transformed from one form to another. (   )
11. When pedalling a bike, the chemical energy in your body changes to kinetic energy. (   )
12. The produced sound energy helps the hair dryer do its function. (   )
13. The amount of energy entering any device equals the sum of the energies produced by it. (   )
14. The amount of electrical energy used to charge a mobile phone is greater than the produced light energy. (   )

3 Write the scientific term:

1. It's a robot vehicle that is used to explore the surface of Mars. (..................)
2. It's the form of energy that is stored in a battery. (..................)
3. It's the main source of energy for most forms of energies on Earth. (..................)
4. It's the energy produced when the wood of trees is burned. (..................)
5. It's the energy is stored in plants in the form of sugar. (..................)
6. It's a path that shows the energy flow from its source to the device. (..................)
7. It's a device used to convert electrical energy into light energy. (..................)
8. It's the output energy that helps the electric kettle do its function. (..................)
9. It's the energy produced from the blender that helps it do its job. (..................)
10. It's the energy produced from playing the guitar. (..................)
11. It's the lost energy when using a computer. (..................)
12. It's the energy that is always produced due to friction. (..................)
13. It's the material that electric wires are made from. (..................)
14. It's the lost energy when using the mobile for a long time. (..................)

4 Complete the following sentences:

1. In any energy chain, some of the energy is lost in the form of ....
2. The energies that are produced from the washing machine are .... energy and .... energy.
3. .... can be used in electric power stations to generate electricity.
4. In the electric heater, ... energy is considered an input energy, while thermal energy is considered an .... energy.
5. To operate an electric mixer, we use .... energy.

5 Cross out the odd word:

1. Food – Battery – Lamp – Coal (..................)
2. Hair dryer – Blender – Washing machine – Light bulb (..................)

6 Choose from column (A) what suits it in column (B):

A

Column (A)	Column (B)
1. Solar energy	a. is the source of energy for Curiosity Rover.
2. Chemical energy	b. is produced when the toy car is operated.
3. Kinetic energy	c. is stored inside a battery.

1. .... 2. .... 3. ....

B

Column (A)	Column (B)
1. Chemical energy	a. is the energy produced during running.
2. Sound energy	b. is the input energy in a soap dispenser.
3. Kinetic energy	c. is the produced energy from the radio.
4. Potential energy	d. is stored inside a tree.

1. .... 2. .... 3. .... 4. ....

C

Column (A)	Column (B)
1 Solar panels	a. converts electrical energy into sound energy.
2 Electric fan	b. changes electrical energy into light and thermal energies.
3 Radio	c. changes electrical energy into kinetic energy.
4 Electric bulb	d. change solar energy into electrical energy.

1 .... 2 .... 3 .... 4 ....

D

Column (A)	Column (B)
1 Chemical energy	a. is the lost energy when operating a mobile device for a long time.
2 Light energy	b. is used to charge the mobile battery.
3 Electrical energy	c. is stored inside the mobile battery.
4 Thermal energy	d. is produced from the mobile phone.

1 .... 2 .... 3 .... 4 ....

7 Study the following figures, then complete the questions below:

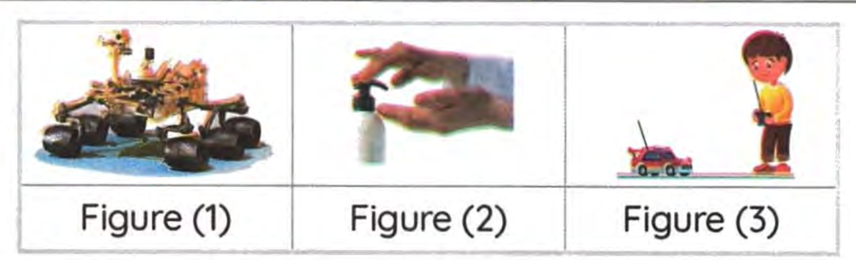


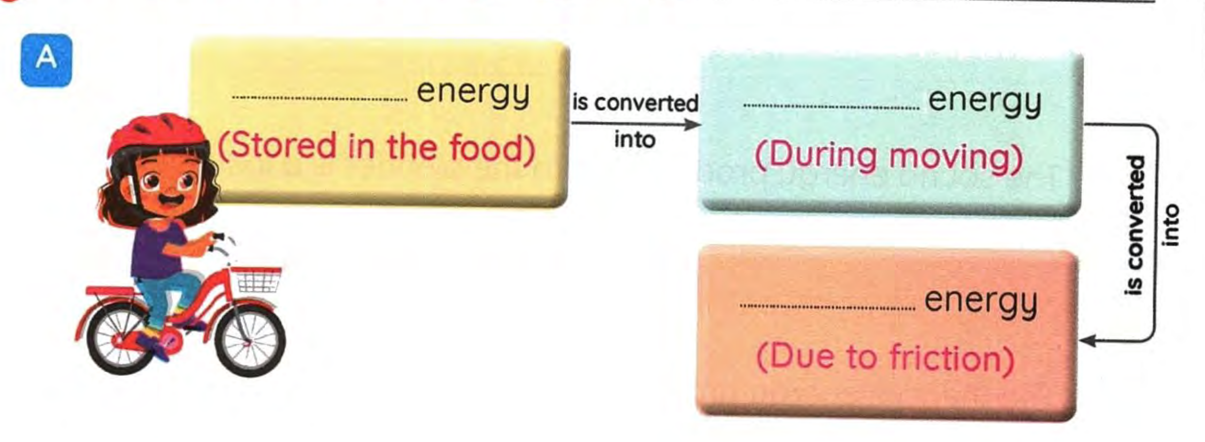
Figure (1) Figure (2) Figure (3)

1. .... energy is the output energy in all these figures.
2. Figure (..........) depends on solar energy to be operated.
3. Figures (..........) and (..........) can be controlled from a distance.
4. The input energy of figure (..........) is the chemical energy stored in the battery.
5. The input energy of figure (..........) is potential energy.

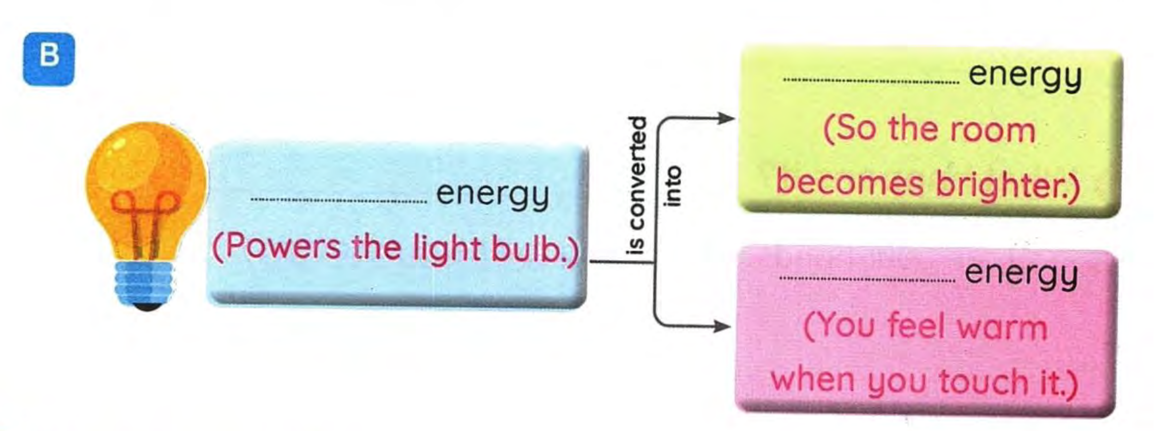


8 Complete the following diagrams:

A



B



9 Give reasons for:

1. The batteries used to operate toys can't be used in operating the Mars Rover.

   ....

   ....

2. There is a change in energy when burning the wood of trees.

   ....

   ....

3. During running, there is a change of energy in your body.

   ....

   ....

4. You feel warm when you put your hands near a lighted light bulb.

....

....

5. The sound energy produced from the blender is a lost energy.

....

....

6. The thermal energy produced from the electric heater isn't lost energy.

....

....

10 What happens if?

1. You rub your hands? (According to energy changes)

....

....

2. You switch on an electric bulb? (According to energy changes)

....

....

3. You operate an electric fan? (According to energy changes)

....

....

4. You operate your mobile device for a long time?

....

....

Concept 2 About Fuel

1 Summary of Concept 2

- The Sun is considered the main source of energy.
- Fuel stores chemical energy inside it.
- Fuel is a material that releases thermal energy when burned.

Uses of fuel:



Gasoline or natural gas are used in operating all means of transportation.

Oil, natural gas, or coal are used in generating electricity.





Coal or wood are used in warming houses.

Coal, natural gas, or wood are used in cooking food.



Cars and fuel

- A car needs fuel to move.
- As the speed of the car increases, the amount of used fuel increases.
- If the fuel runs out, the car will stop.



How is a car operated?





1. Gasoline burns inside the car's engine. (Thermal energy)
2. The car's engine rotates the wheels of the car. (Kinetic energy)

Types of fuel:

1 Biofuel Renewable resource	2 Fossil Fuel Nonrenewable resource
	
• It is the fuel that is made from living things that can be **planted**	• It is the fuel that was formed from the remains of plants and animals that lived millions of years ago. • Fossil fuel is extracted from **underground**.
Examples	
1 **Wood** (The most ancient fuel) 2 **Grass** 3 **Corn** 4 **Charcoal** (Made from wood) 5 **Liquid fuel** (Made from corn, grass, and wood chips)	1 **Coal** (Decomposition of the remains of ancient plants) 2 **Oil and natural gas** (Decomposition of marine animals) 3 **Gasoline** (Formed from oil)
Disadvantages	
• To get it, it requires cutting down trees which may lead to **deforestation**.	• Burning fossil fuel produces **carbon dioxide gas** that may cause **air pollution**, **acid rain** and **global warming**.

How do we conserve fossil fuel 

1. Walking or biking instead of driving a car.
2. Turning off the lights when you aren't in a room.
3. Replacing fossil fuel with renewable energy resources.

1 Acid Rain	2 Global Warming
Way of Formation	
• Carbon dioxide gas combines with water in the air to form acid rain.	1 The amount of carbon dioxide gas in the air increases forming a layer in the atmosphere. 2 This layer traps heat on the Earth, raising Earth's temperature.
Disadvantages	
1 Trees die. GR Due to the chemical changes in the structure of the soil. 2 Fish die. GR Due to the chemical changes in the structure of the lakes. 3 Decomposition of some rocks	• Increasing the Earth's temperature.

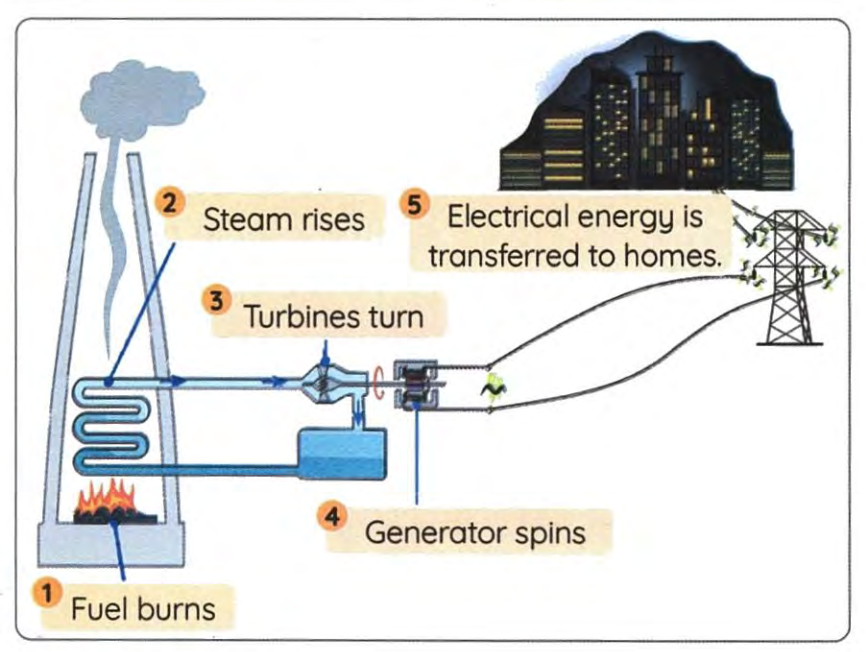






1 Water	2 Oil
Similarity	
• They're used to generate electricity.	
Differences	
• Renewable resource of energy	• Nonrenewable resource of energy
• We must use water carefully and not waste or pollute it. • If we waste or pollute water, it may not be replaced as quickly as we need.	**Formation of oil:** 1 Marine organisms died millions of years ago. 2 Layers of sediments and rocks cover the remains. 3 Over time, those remains are converted into oil due to extreme heat and pressure.

Generating Electricity Using Fossil Fuel





1 Fuel burns

- When fuel (coal, oil, or natural gas) burns, it releases thermal energy.

2 Steam rises

- This thermal energy is used to heat water to produce steam.

3 Turbines turn

- The steam is directed to tubes to turn turbines.

4 Generator spins

- Turbines make the generator spin and convert kinetic energy into electrical energy.

5 Electrical energy is transferred to homes

- Electrical energy travels through cables to homes and factories.

How do we conserve electricity 

1. Turning off the lights we don't need.
2. Unpluging electrical appliances after using them.
3. Setting a regular electricity-free time.

2 Definitions of Concept 2

Gasoline pointer	It's a device that helps the driver of the car check the amount of fuel.
Gasoline	It's a liquid that forms from oil and is used in moving cars.
Fuel	It's a material that releases thermal energy when it is burned.
Chemical energy	It's a kind of energy stored in fuel.
Thermal energy	It's the energy released from burning fossil fuel.
Renewable resources	• They are natural resources that are can be renewed after a short time of being used. • They are energy resources that include solar energy and hydroelectricity.
Nonrenewable resources	• They are energy resources that are used at a faster rate than they can be replaced. • They're energy resources that include all kinds of fossil fuel.
Biofuel	It is a type of fuel that is made from the living organisms that can be planted.
Fossil Fuel	• It is a type of fuel that is extracted from deep ground under the Earth's surface. • It is a type of fuel that is formed by the decomposition of old, dead organisms buried under the ground.
Oil and Natural gas	They are types of fossil fuel produced the decay of dead marine organisms (sea creatures).
Coal	It is a type of fossil fuel produced from the decomposition of ancient dead plants and trees.

Extreme heat and pressure	They're the factors needed for the formation of fossil fuel.
Charcoal	It is a kind of biofuel that is made from the wood of trees.
Liquid fuel	It is a kind of biofuel that is made from corn, grass and wood chips.
Wood	It is the oldest fuel that ancient people used.
Deforestation	It's a phenomenon that results from cutting trees at a faster rate to get wood.
Generator	It's a device that changes kinetic energy into electrical energy in electric power stations.
Carbon dioxide gas	It's a gas that causes global warming and acidic rains.
Global warming	It is a phenomenon in which the Earth's temperature increases when carbon dioxide gas increases in the air.
Acid rain	It is formed when carbon dioxide mixes with water in the air, and it causes the decomposition of some rocks and the death of trees.



3 Give Reasons for... Concept 2

1 Gasoline is very important for cars to move.

- Because gasoline burns inside the car engine, allowing the engine to rotate the wheels.

2 The gasoline pointer is very useful for drivers.

- To help the driver check the amount of gasoline (fuel) in the car.

3 Coal and wood are very important for warming houses.

- Because they produce thermal energy when burned.

4. **Biofuel is a renewable resource of energy.**
   - Because it is renewed with the continuous growth of plants.

5. **Fossil fuel is a nonrenewable resource of energy.**
   - Because it starts to run out as we use it and can't be renewed easily.

6. **Biofuel has a negative effect on the environment.**
   - To get biofuel, it requires cutting down trees, which may lead to deforestation.

7. **Fossil fuel has a negative effect on the environment.**
   - Because burning fossil fuels produces carbon dioxide, which increases air pollution and causes global warming.

8. **Using coal or natural gas in electric power stations.**
   - To get the thermal energy needed to heat water and produce steam.

9. **It is necessary to conserve fossil fuel.**
   - To reduce air pollution.

10. **Walking or biking is better than driving cars.**
    - To reduce the amount of burning fossil fuel and reduce air pollution.

11. **Water is a renewable resource of energy.**
    - Because it is available and hasn't run out yet.

12. **We must use water carefully, and not waste or pollute it.**
    - Because if we waste or pollute water, we can't replace it as quickly as we need.

13. **We should conserve electricity.**
    - To avoid burning more fossil fuels and air pollution.

14. **Generators play an important role in the electric power stations.**
    - Because generators convert kinetic energy into electrical energy.

15. **Turbines play an important role in electric power stations.**
    - Because the kinetic energy of turbines is used to spin generators.

16. **Engineers work on improving solar vehicles.**
    - To reduce the burning of fossil fuel of normal vehicles and reduce air pollution.

17 Smog has a bad impact on the human's respiratory system.

- Because smog consists of small harmful particles that irritate the lungs and cause damage to lung tissues.

18 Formation of acid rain.

- Because carbon dioxide gas combines with water in the air to form acid rain.

19 Acid rain has many negative effects on the environment.

Because acid rain may cause:

1- The death of trees. 2- The death of fish.

3- The decomposition of some rocks, including bricks of buildings.

4 What Happens if...? Concept 2

1 The car's engine runs out of fuel.

- The car will stop.

2 We cut down trees at a fast rate to get wood.

- It leads to deforestation.

3 The remains of plants decompose over millions of years.

- Coal will be formed.

4 The remains of sea animals decompose over millions of years.

- Oil or natural gas will be formed.

5 We waste water or pollute it.

- We may not be able to replace it as quickly as we need.

6 Generators are turned on.

- Generators change kinetic energy into electrical energy.

7 A person is exposed to smog.

- Smog will irritate his/her eyes and lungs.

8 Carbon dioxide gas forms a layer in the atmosphere.

- Global warming happens because Earth's temperature increases slowly.

5 Revision on Concept 2

1 Choose the correct answer:

1. All the following are found deeply under the Earth´s surface, except ....
   a. coal b. oil c. natural gas d. green plants
2. .... energy is stored inside coal.
   a. Thermal b. Solar c. Chemical d. Electrical
3. If we are going on a long road trip, we must check the ....
   a. seats b. doors c. speedometer d. gasoline pointer
4. Fuel is used as a source of .... energy.
   a. thermal b. chemical c. light d. solar
5. All the following are extracted from underground, except ....
   a. coal b. charcoal c. petroleum d. natural gas
6. .... is a renewable resource of energy.
   a. Oil b. Coal c. Gasoline d. Corn
7. Coal is formed underground due to the decomposition of dead ....
   a. plants b. animals c. humans d. birds
8. .... takes millions of years to be formed.
   a. Coal b. Charcoal c. Wood d. Corn
9. One of the disadvantages of overusing biofuel is ....
   a. overfishing b. wildfire c. deforestation d. acid rain
10. Both water and oil ....
    a. are renewable resources b. are nonrenewable resources
    c. have the same structure d. can be used to generate electricity
11. By heating water, it turns into ....
    a. steam b. ice c. electricity d. fuel

12. The steam produced in the electric power station is directed into tubes to turn the ....
    a. turbines b. motors c. mills d. lamps
13. Electrical energy travels through .... to homes and factories.
    a. tubes b. motors c. cables d. fans
14. .... and .... are included in fossil fuel formation.
    a. Heating - cooling b. Burying - cooling
    c. Decaying - heating d. Decaying - growth
15. Smog damages the tissues of the .... system.
    a. digestive b. circulatory c. respiratory d. nervous
16. Cars' smog causes irritation of humans' ....
    a. small intestines b. brains c. hearts d. eyes
17. Acid rain is formed when .... combines with water.
    a. oxygen b. carbon dioxide
    c. hydrogen d. nitrogen
18. Using .... to produce electrical energy is expensive.
    a. solar energy b. oil c. natural gas d. coal
19. Burning fossil fuel causes all the following, except ....
    a. pollution b. acid rain c. global warming d. deforestation

2 Put (✓) or (✗):

1. As the speed of the car increases, the amount of the used fuel decreases. ( )
2. We cannot drive a car if the gasoline inside the fuel tank runs out. ( )
3. Thermal energy is produced by burning a piece of wood. ( )
4. Cars, buses, and bicycles need gasoline to run on roads. ( )
5. Coal is the oldest fuel that has been used all over the world by ancient people. ( )
6. Fossil fuel is made from living things that can be grown. ( )
7. The consumption rate of coal is slower than its formation rate. ( )
8. Water may not be replaced as quickly as we need. ( )

9. Some plants are used to make liquid biofuel. ( )
10. The movement of a generator in an electric power station produces potential energy. ( )
11. Turbines are operated by steam in electric power stations. ( )
12. Using energy-saving light bulbs conserves electricity. ( )
13. On cooling water, it turns into steam in electric power stations. ( )
14. Pesticides cause soil and water pollution. ( )
15. When the burning of fossil fuel increases, the temperature on Earth decreases. ( )
16. Mixing water with oxygen gas produces acid rain. ( )
17. The amount of fossil fuel on Earth is unlimited. ( )

3 Write the scientific term:

1. It's a device that helps the car driver check the amount of fuel. (..........)
2. It's a liquid fossil fuel that burns inside the car engine. (..........)
3. It's a kind of energy that is stored in fuel. (..........)
4. It's a form of energy produced by burning fuel. (..........)
5. It's a material that releases thermal energy on burning. (..........)
6. It is a natural resource that is used faster than it can be replaced. (..........)
7. It is a natural resource that can be replaced soon after it is used. (..........)
8. It is the fuel that is made from living organisms that can be planted. (..........)
9. It is the fuel that is extracted from deep ground under the Earth's surface. (..........)
10. It's a kind of fossil fuel that is produced from the decomposition of dead marine organisms. (..........)
11. It's a kind of fossil fuel that is produced from the decomposition of dead plants. (..........)
12. It's a kind of biofuel that is made of the wood of trees. (..........)

13 It's a kind of biofuel that is made of corn and grass. (..........................)

14 It's the energy produced by the generator. (..........................)

15 It's a device that operates generators. (..........................)

16 It's a device in the electric power stations that changes the kinetic energy into electrical energy. (..........................)

17 It is a phenomenon in which the Earth's temperature increases when carbon dioxide gas increases in the air. (..........................)

18 It is a phenomenon that causes the decomposition of some rocks and the death of trees. (..........................)

19 It's a gas that causes global warming and acid rain. (..........................)

4 Complete the following sentences:

1 Some forms of fuel, such as .... and ...., can be used in warming houses.

2 Extreme .... and .... are the factors needed for the formation of fossil fuel underground.

3 Water is considered a .... resource of energy, while oil is a .... resource of energy.

4 Turbines in electric power stations are turned by ...., and they produce kinetic energy to run the .... of the electric power stations.

5 The electric generator changes the .... energy into .... energy.

6 To avoid air pollution, we must use .... resources of energy.

7 Smog causes .... pollution.

8 Pesticides causes .... and .... pollution.

5 Complete the following using the words between the brackets:

(wood - deforestation - underground - oil)

1 Ancient people used .... in cooking food and warming.

2 Gasoline is made from ...., while coal is extracted from ....

3 Cutting trees with a fast rate causes ....




6 Choose from column (A) what suits it in column (B):

A

Column (A)	Column (B)
1 Chemical energy	a. is generated in electric power stations.
2 Kinetic energy	b. is stored inside fuel.
3 Thermal energy	c. is produced when the car wheels rotate.
4 Electrical energy	d. is produced when burning a piece of coal.

1 .... 2 .... 3 .... 4 ....

B

Column (A)	Column (B)
1 The Sun	a. takes a very long time to be formed.
2 Fossil fuel	b. takes a short time to be formed.
3 Biofuel	c. is the primary source of all kinds of energy.

1 .... 2 .... 3 ....

C

Column (A)	Column (B)
1 Liquid fuel	a. was used by ancient people.
2 Gasoline	b. is made from grass, corn, and wood chips.
3 Charcoal	c. is a fuel that is made from oil.
4 Wood	d. is made from wood.

1 .... 2 .... 3 .... 4 ....

D

Column (A)	Column (B)
1 Generators	a. produces thermal energy.
2 Turbines	b. produce electrical energy.
3 Burning fuel	c. is produced from heating water.
4 Steam	d. produce kinetic energy.

1 .... 2 .... 3 .... 4 ....

7 Cross out the odd word:

1. Wood - Oil - Corn - Charcoal (..................)
2. Sun - Wind - Water - Coal (..................)
3. Coal - Charcoal - Natural gas - Oil (..................)

8 Give reasons for:

1. The fuel (gasoline) pointer is very useful for drivers.

....

2. Fossil fuel is considered a nonrenewable resource of energy.

....

3. Biofuel is considered a renewable resource of energy.

....

4. Generators play an important role in electric power stations.

....

5. The fossil fuel amount on Earth is limited.

....

6. Engineers work on improving solar vehicles.

....

9 What happens if?

1. We burn a piece of coal?

....

2. We cut down trees at a faster rate than they can grow?

....

3. Oil is burned inside electric power stations?

....

4. Water is heated in electric power stations?

....

5. Acid rain falls on buildings?

....

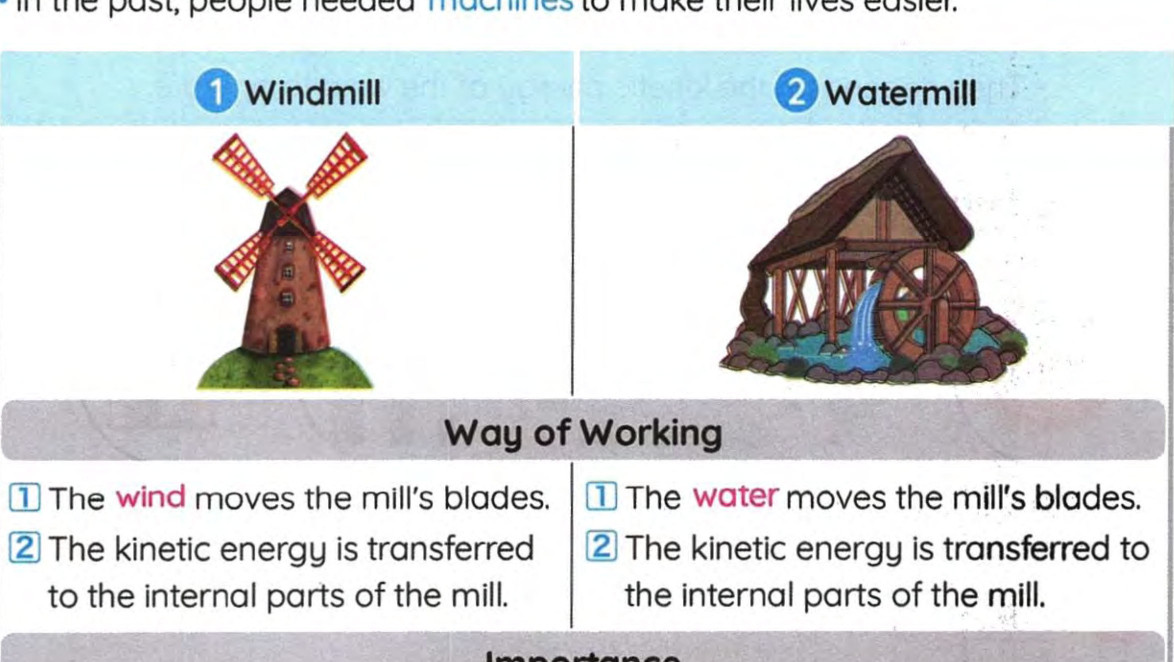
Concept 3 Renewable Energy Resources

1 Summary of Concept 3

Renewable resources of energy: They are natural resources that are replaced (**renewed**) at a faster rate than they are consumed.

First: Wind Energy

- In the past, people needed machines to make their lives easier.



1 Windmill	2 Watermill
Way of Working	
1 The wind moves the mill's blades. 2 The kinetic energy is transferred to the internal parts of the mill.	1 The water moves the mill's blades. 2 The kinetic energy is transferred to the internal parts of the mill.

Importance

- They are used to crush (grind) grains and make flour.



Advantages

- Low cost
- Renewable energy resources

Disadvantages



Sometimes the wind doesn't blow, so it can't do its main job.	Sometimes, the water supply may dry up, so it can't do its main job.

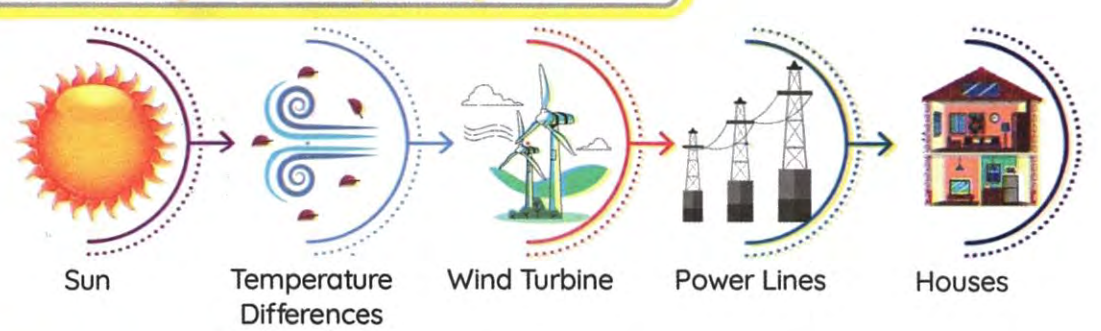
Modern turbines are used now instead of old windmills.





1 Modern Wind Turbines	2 Old Windmill
Function	
• Generating electricity	• Grinding the grains to make flour
Differences	
• They are **taller than** windmills. • They have **fewer** blades than windmills. • The blades have **no openings**.	• They are **shorter** than wind turbines. • They have **more** blades than wind turbines. • The blades have **openings**.
Similarity	
• They depend on the kinetic energy of the wind to operate.	

Generating Electricity Using the Wind



1. **Solar energy** causes the air to move and the wind to blow.

2. The kinetic energy of the **wind** rotates the blades of the **wind turbines** that are used to spin the generators.

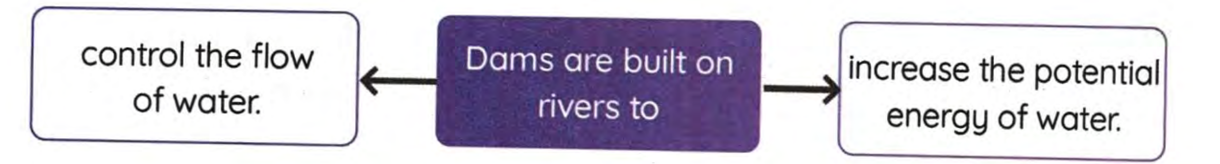
3. The **generators** change kinetic energy into electrical energy.

4. **Electricity** is transferred through big wires towards cities to light houses and streets.

Second: Water Energy

Hydroelectricity: (Hydroelectric energy)

- It is a type of electrical energy generated by water turbines in dams.



How can water be used to generate electricity



1. A hydroelectric dam holds back the flow of water to increase its potential energy.

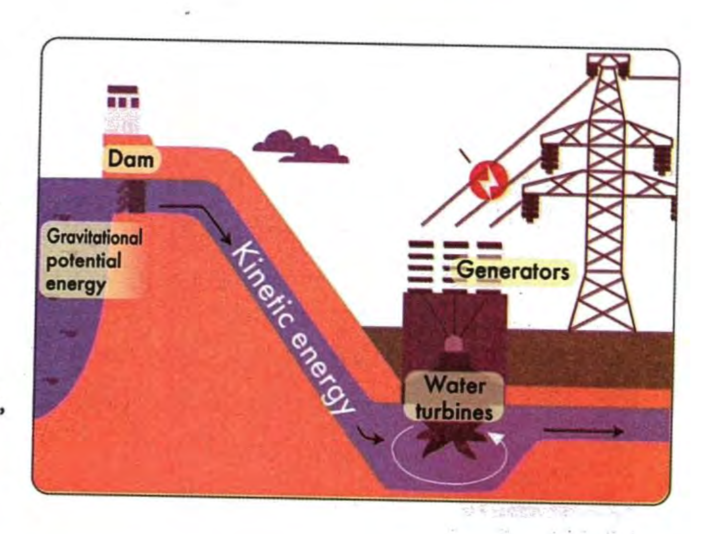


2. When the water is released, it passes through the blades of turbines, so they rotate.



3. Turbines operate the generators, so kinetic energy is converted into electrical energy.

4. Electricity is transferred to cities through long electric wires.



P.O.C	1 Wind Turbines	2 Water Turbines
Differences	• They are placed in windy places.	• They are placed in places where dams are built on rivers.
Similarities	1 Both of them are **renewable resources**. 2 Both of them use **kinetic energy** to turn turbines. 3 Both of them are used to **generate electricity**.	

Third: Solar Energy

1. It is the main source of all kinds of energy on Earth.
2. The sunrays are called radiant energy (radiation).
3. The Sun provides us with light and heat.
4. The energy received from the Sun is called solar energy.

Sun

Uses of Solar Energy

- We can use solar energy as a source of thermal energy

1 Greenhouses



Importance:

- They help farmers plant the crops that need warm climates.

How does it work?

1. A greenhouse allows the entry of light and radiant energy from the Sun.
2. Radiant energy changes to thermal energy inside it.
3. Thermal energy warms the greenhouse from inside.

2 Warming



a. Warming Ourselves
- When exposing yourself to the Sun, you feel warm.

b. Warming Houses
- By placing large windows on the wall that faces the sun.

3 Concave mirrors



- They collect and focus the sunlight to heat a metal pot and cook the food inside.

4 Solar water heater

Structure: It contains panels made of black pipes.

Location: It can be placed on the roof of a house.

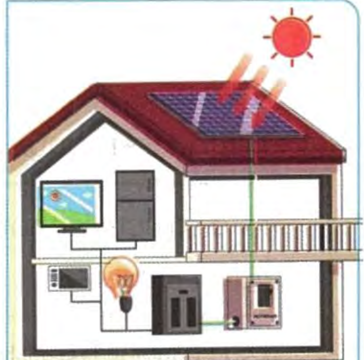
How does it work?

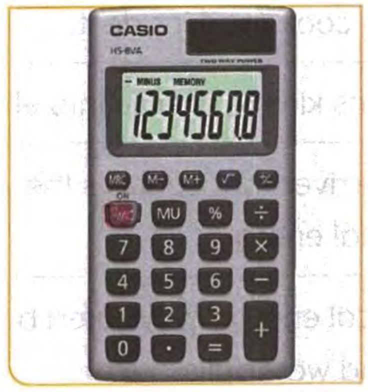
1. As water passes through the pipes, it heats up.
2. Water can then be stored in a hot water tank to be used later.

Solar Panels

Structure	• They consist of a large number of small solar cells.
Idea	• Solar cells capture the radiant energy coming from the Sun and turn it directly into electricity.
Size	• Very small to supply only one light bulb with energy • Very large to supply buildings or cities with energy
Uses	Most solar panels are used to generate electricity to: 1 Light houses and streets. 2 Operate electric devices. 3 Recharge batteries of solar-cell calculators. 4 Power irrigation equipment in some villages.









2 Definitions of Concept 3

Renewable energy resources	They are energy resources that include wind energy and water energy.
Old windmill	It's a machine that used the kinetic energy of the wind to grind grains to make flour.
Watermill	It's a machine that used the kinetic energy of the water to grind grains to make flour.
Modern wind turbines	They use the kinetic energy of the wind to generate electricity.
Solar panels	They are composed of many solar cells. They absorb solar energy (sunlight) and convert it into electrical energy.
Greenhouse	It's a structure that helps farmers to plant crops that need warm climate.
Concave mirror	It's a mirror used to direct and focus sunrays toward the metallic pot used to cook food inside it.
Generator	It's a device that turns kinetic energy into electrical energy.
Dam	It's a building on the river that controls the water flow and increases its potential energy.
Hydroelectricity	It's a type of electrical energy generated by water turbines in dams and waterfalls.
Evaporation	It's a process in which water changes into water vapor.
Condensation	It's a process in which water vapor changes into water.

3 Give Reasons for... Concept 3

1. People use machines.
   - To make their life easier and do tasks faster.
2. Solar energy is a renewable resource of energy.
   - Because solar energy is the energy that will not run out as we use it.
3. People used windmills and watermills 400 years ago.
   - To grind grains to make flour.
4. People now use modern wind turbines.
   - To generate the electricity needed to light houses and operate different devices.
5. Using windmills and watermills has a lot of advantages.
   - Due to their low cost and because they depend on renewable resources.
6. Using windmills and watermills has great disadvantages.
   - Sometimes the wind does not blow or the water supply may dry up.
7. We feel the warmth of the Sun at night.
   - Because the atmosphere, water and soil absorb heat energy from the Sun.
8. Greenhouses help farmers in the agricultural field.
   - Because they help farmers in planting crops that need warm weather.
9. We place large windows on the wall that faces the Sun.
   - To enable the energy of the Sun to warm the house.
10. Concave mirrors are used in cooking.
    - To direct the sunrays towards the cooking pans to cook food inside them.
11. The panels made of black pipes can be placed on the houses' roofs.
    - To heat water, then store it in a hot water tank.
12. Solar panels are used in generating electricity for lighting houses and streets.
    - Because they convert solar energy into electrical energy.
13. The Sun is the main source in generating electricity from windmills.
    - Because the Sun warms the Earth and the wind. Different parts of the world get different amounts of solar energy. This causes the blowing wind to rotate the blades of the windmills.

14 Dams are built on rivers.

- To control the flow of water and increase the gravitational potential energy of water to generate electricity.

15 Water returns to rivers after flowing.

- Because water evaporates, then it condensates in the form of clouds and returns to the rivers in the form of rain.

16 Renewable resources of energy are considered clean resources of energy.

- Because they don't need burning fossil fuel to generate electricity, so they don't pollute the environment.

17 There are conditions required for wind turbines to work with high efficiency.

- Because they should exist in windy regions.

4 What Happens if...? Concept 3

1 Wind doesn't blow in an area that contains many wind turbines.

- The wind turbines will not move, so they can't generate electricity.

2 Water falls on the blades of water turbines.

- The blades will rotate, so they can generate electricity.

3 The force of wind increases in an area that contains many wind turbines.

- The blades rotate faster, and the efficiency of the wind turbines increases.

4 Sunlight falls on a greenhouse.

- Radiant energy changes to thermal energy inside the greenhouse which warms the greenhouse from inside.

5 Sunlight falls on a concave mirror.

- The concave mirror focuses the sunlight on the cooking pot to cook food inside it.

6 Sunlight falls on a solar-cell calculator.

- It changes solar energy to electrical energy to charge its batteries.

7 Water is released from a dam.

- The gravitational energy of water changes into kinetic energy to rotate the water turbines and generate electricity.

5 Revision on Concept 3

1 Choose the correct answer:

1. All the following are considered renewable resources of energy, except ....
   a. wind b. coal c. the Sun d. water
2. The main function of .... is grinding the grains and making flour.
   a. modern turbines b. solar panels
   c. dams d. watermills
3. Both modern wind turbines and old windmills are similar in their........ .
   a. blades number b. ways of working
   c. heights d. blades shape
4. Modern turbines are .... than old windmills.
   a. longer b. shorter c. heavier d. slower
5. The source of all energies on Earth is ....
   a. wind b. the moon c. the Sun d. water
6. In winter, greenhouses help farmers grow plants that need ....
   a. warm weather b. cold weather
   c. less water d. less sunlight
7. Solar panels can be used operate all the following, except ....
   a. a calculator b. a gas oven
   c. irrigation equipments d. street lights
8. The .... energy of the Sun causes air movements and wind blowing.
   a. chemical b. radiant c. electrical d. sound
9. The electricity from wind turbines is transmitted into houses and factories through ....
   a. the wind b. devices c. generators d. wires
10. Hydroelectric power is produced using ....
    a. air b. water c. soil d. plants
11. Water of rivers stores great .... energy at the top of the waterfalls.
    a. kinetic b. potential c. electrical d. light
12. The power source for the electric fan is ....
    a. wind b. water c. heat d. electricity

2 Put (✓) or (✗):

1. Windmills can do their job all the time, as the wind never stops blowing. ( )
2. When the kinetic energy of the wind increases, the windmill blades spin faster. ( )
3. Both modern wind turbines and old windmills are used to generate electricity. ( )
4. Electricity generated by wind turbines is transmitted through the wind. ( )
5. The power source for the electric fan is wind. ( )
6. Wind turbines convert kinetic energy into electrical energy. ( )
7. We use solar energy to preserve food. ( )
8. We feel the warmth of the Sun during the day only. ( )
9. A solar cell consists of a large number of small solar panels. ( )
10. A calculator's output energy is solar energy. ( )
11. Small solar panels may be able to light buildings. ( )
12. The flow of water in dams can be controlled to generate electricity. ( )
13. Electricity generated from water is called hydroelectricity. ( )
14. Rivers store kinetic energy. ( )
15. The electricity produced by water is known as electromagnetic energy. ( )

3 Write the scientific term:

1. They are energy resources that include wind energy and water energy. (..................)
2. They are used to collect and focus sunrays towards the cooking pots. (..................)
3. It's a device that the wind rotates its blades to generate electricity. (..................)
4. It's a device that consists of black pipes used to heat water. (..................)
5. It's the device in an electric power station that turns kinetic energy into electrical energy. (..................)

6 It's a structure on the river that controls the flow of water and increases the potential energy of water. (..........)

7 It's a type of electrical energy generated by water turbines in dams. (..........)

4 Complete the following sentences:

1 When the wind turbines rotate, ... energy is converted into .... energy.

2 Both wind and water movements produce .... energy, which is used to rotate turbines to generate .... energy.

3 The number of blades in modern wind turbines is .... than in old windmills.

4 We can use solar energy in cooking using concave ...., which collect and focus the .... onto the metal pots to heat them.

5 .... help farmers grow crops that need warm weather.

6 Solar energy causes the air to .... and the wind to ....

7 Electricity is transferred to cities through ....

5 Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
1 Greenhouses	a. are used in heating water.
2 Concave mirrors	b. are used in planting some kinds of crops.
3 Panels of black pipes	c. are used in cooking food.

1 .... 2 .... 3 ....

6 Study the following figures, then complete the sentences below:

Figure (1)	Figure (2)

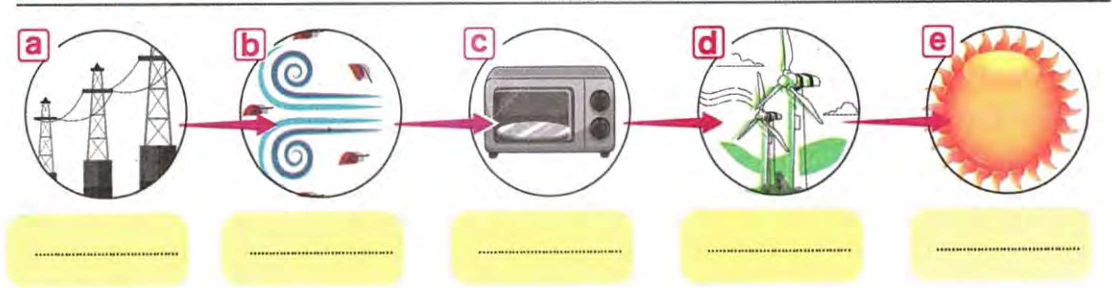
1 Figure (..........) is used to grind grains.

2 The machine in figure (..........) is shorter than the machine in figure (..........).

3 Both of them are similar in ....

4 Both of them depend on ....

7 To generate electricity, arrange the following figures from start to end:



....

8 Give reasons for:

1. People used windmills and watermills 400 years ago.

....

2. People now use modern wind turbines.

....

3. You feel the warmth of the Sun at night.

....

4. Greenhouses are very important to farmers.

....

5. Generators have an important role in electric power stations.

....

6. Dams are built on rivers.

....

9 What happens if?

1. Wind doesn't blow in an area that has wind turbines?

....

2. The kinetic energy that is applied on the wind turbines increases?

....

3. The water of dams becomes free?

....

Concept 1 Breaking Down and Moving Rocks

1 Summary of Concept 1

- The Earth's surface always changes.

Sandcastles	Coastal rocks	Canyons
• They have steep parts and sloping sides at the bottoms. • They disappear after a short time due to the erosion of the sea waves.	• They have steep parts and sloping sides at the bottoms. • There may be a little difference as breaking off some parts by wind or water after many years.	• They have steep needle-like parts with slopes at the sides. • They take millions of years to be formed.
(A rapid change)	(A slow change)	(A slow change)





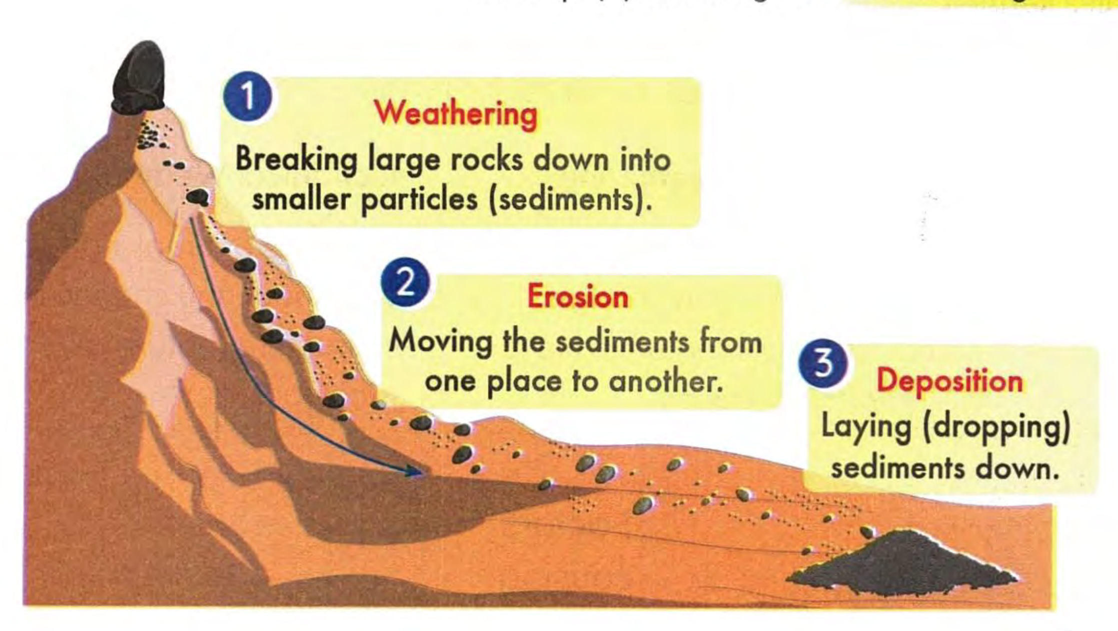


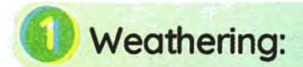
Canyon:
- has steep needle-like parts
- is formed due to slow changes
- is created by water
- has inclined sides at bottom

Shaping the Earth's surface

- Wind, water, and weather conditions are the factors that cause changes of the Earth's surface.
- Earth's surface changes through three processes which are weathering, erosion, and deposition.

1 Weathering → 2 Erosion → 3 Deposition





1 Weathering:



- The changing of the Earth's surface begins with the **weathering process**.

Weathering

Is the process of breaking down rocks into small (tiny) particles.

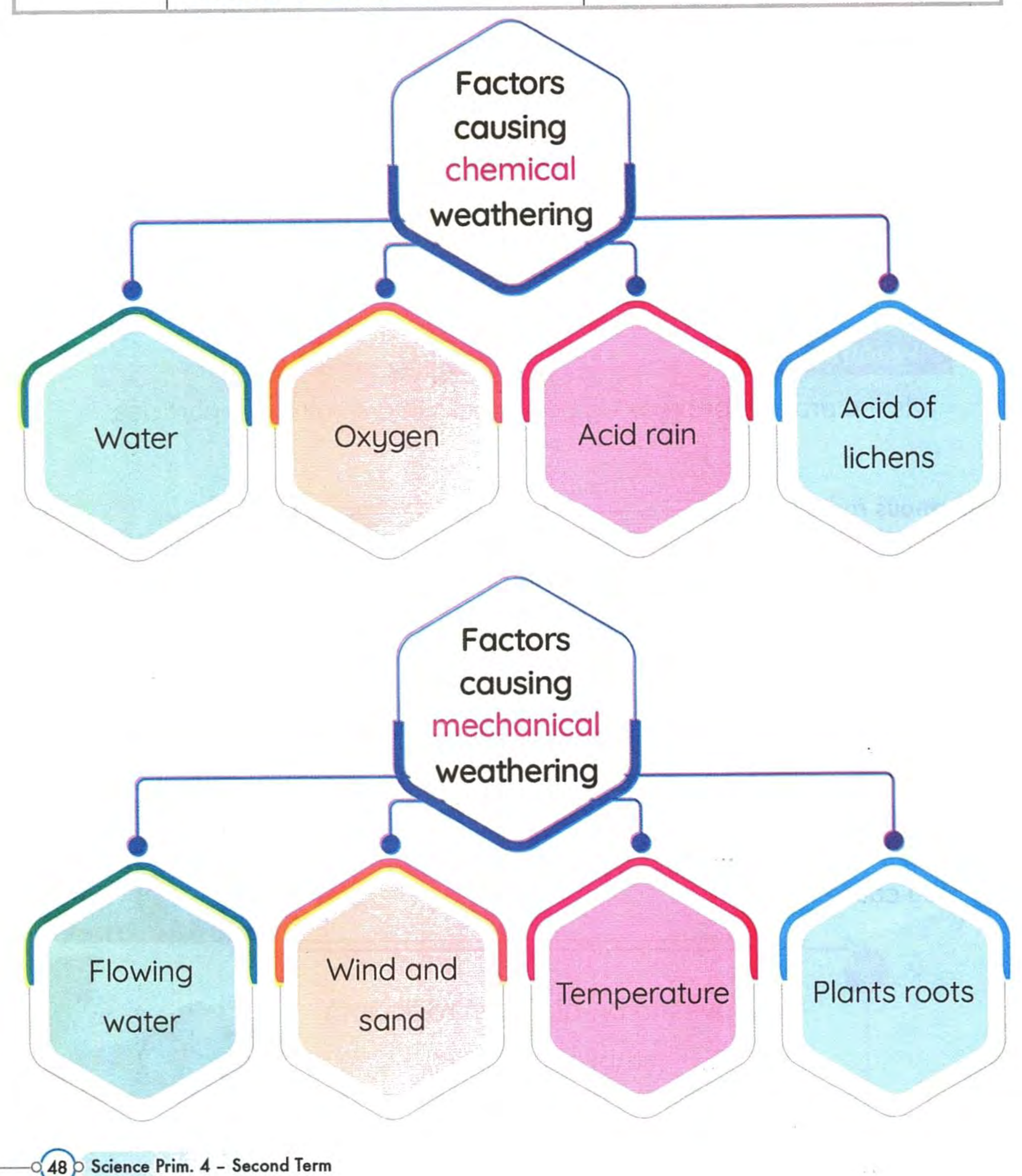
Enormous rocks (that makes up mountains) → are broken down into → **boulders** → are broken down into → **smaller rocks** → are broken down into → **sand**

Weathering may cause

1. A breakdown (crumbling) of status.
2. Paint to peel on a building.
3. Waves to break down rocks into smaller particles.

Types of Weathering

P.O.C	Chemical Weathering	Mechanical Weathering
Definition	• The process of breaking rocks down with a change in their structure (nature) due to chemical reactions.	• The process of breaking rocks down without any change in their structure (nature) due to physical factors.



Factors causing chemical weathering

1. Water



- Water dissolves minerals in the rocks, and then those **dissolved minerals** recombine again, forming new shapes, as in **limestone caves**.

2. Oxygen



- **Oxygen** in the air reacts with the **iron** in some rocks, forming **red-colored rust** that causes rocks to be weak and easily broken.

3. Acid rain



- Acid rain falls on rocks.
- These acids dissolve minerals in the rocks, so they become weaker and break down easily.

4. Acid of lichens



- Lichens produce acids on rocks.
- These acids dissolve minerals in the rocks, so they become weaker and break down easily.

Factors causing mechanical weathering

1. Flowing water

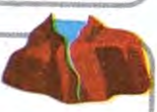


- Flowing water carrying some sand and gravel causes:

a. Scouring edges off boulders.

b. Breaking off large pieces of tumbled rocks due to collision with each other.

2. Plants roots



a. Plant roots grow inside the cracks of rocks.

b. Cracks become wider.

c. Rocks are broken down.

3. Wind and sand

a. Wind rushes sand on the rock surface.

b. Friction occurs between sand and rocks.

c. This causes the smoothing of rocks and the breaking down of them.

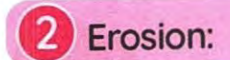
4. Temperature

a. Water flows in the tiny cracks in the rocks.

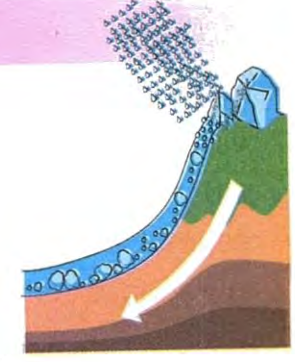
b. Water expands when it turns into ice, then melts.

c. By repeated melting and freezing of water, cracks in rocks become wider, causing the rocks to be broken down.





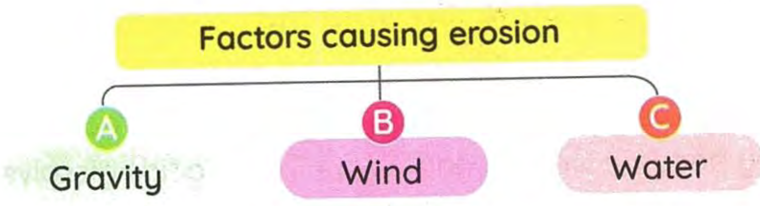
2 Erosion:



Erosion

It is the process of moving sediments from one place to another.

- **Note:** Sediments are weathered sand, soil, and small rocks.



Factors causing erosion

A Gravity

- Gravity pulls rocks down mountainsides.



B Wind

- The wind carries grains of sand from one place to another, where:
  - Strong wind and hurricanes blow sand for long distances.
  - Gentle wind blows sand grains for short distances.



C Water

- **Rivers** and **floods** erode rocks and soil from their banks.
- **Waves** pull sand away from beaches.
- **Rain** washes the soil on hilly farmland downhills.



3 Deposition:

Deposition

It is the process of laying down eroded sediments in a new place.

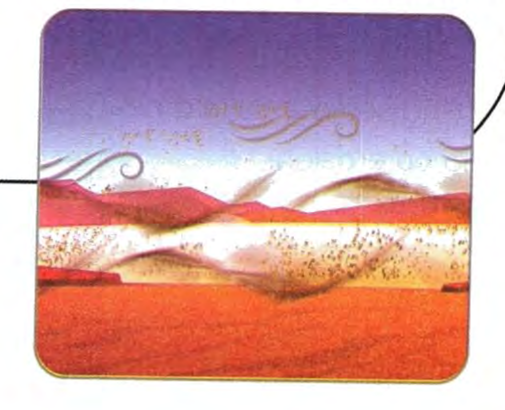
1 Deposition by wind:

- As the wind blows, it picks up sand.
- Wind carries sand to another place.
- When the wind stops blowing, sand is deposited.

This forms:

a Small sand dunes on beaches.

b Large sand dunes in desert.



2 Deposition by water:

- A river carries sediment eroded from its banks.
- When the river carrying sediments meets a sea, it deposits them.

This forms:

- A delta, such as Nile Delta



2 Definitions of Concept 1

Weathering	It is the process of breaking down rocks into smaller pieces.
Mechanical weathering	It is a type of weathering that breaks off rocks without changing its matter(structure).
Chemical weathering	It is a type of weathering that leads to the formation of a different material.
Lichens	They are tiny-like plants that live on rocks and produce acid on them, causing them to break down.
Oxygen gas	It is the gas that reacts with iron in rocks, forming a red-colored rust on some rocks.
Plant's roots	They are a part of the plant that grows in rocks' cracks, causing them to be broken.
Acid rain	It is a natural phenomenon that has the same effect as lichens on rocks.
Erosion	It is the process of moving sediment from one place to another.
Deposition	It is the process of settling sediments in a new place after they have been moved by erosion.
Gravity	It is an eroding factor that pulls the rocks down mountainsides.
River	It is an eroding factor that moves rocks from their banks downstream.
Sediments	They are pieces of weathered rocks that are moved by gravity, wind, water, or other factors.

3 Give Reasons for... Concept 1

1 The Earth's surface is always changing.

- Because of many factors, such as wind, water, and weather.

2 Wind is the main factor changing the Earth's surface.

- Because it can break down rocks and move small rocks to another place.

3 Waves are from factors which can change landforms.

- Because waves can move small parts of sand from one place to another.

4 Changes to the Earth's surface are different in the time of happening.

- Because some changes of the Earth surface happen quickly, such as the disappearance of sandcastles, while others take a very long time, such as formation of canyons.

5 The shape of coastal rocks changes after many years.

- Because some parts of them may be broken off by water or wind.

6 The main source of soil is big rocks.

- Because when the weathering process occurs, the big rocks break down into tiny rocks, then into pebbles or grains of sand.

7 Oxygen gas has a bad effect on rocks.

- Because oxygen gas can react with iron in rocks forming red-colored rust which makes the rock weaker and breaks down easily.

8 Plant roots may have a bad impact on rocks.

- Because as plant roots grow inside rocks, the cracks in the rocks become wider, so the rocks break down.

9 Lichens have a bad impact on rocks.

- Because they produce acids as they grow on rocks that make the rock weaker and break off easily.

10 There are some similarities between the effects of lichens and acid rain on rocks.

- Both of them can dissolve the rocks or changing their nature.

11 Sand and wind team up to wear down large rocks.

- Because wind rushes sand on the surface of the rocks, it smoothes and breaks them down.

12 It is hard to see weathering in action (in most cases).

- Because it takes a long period of time to happen.

13. Chemical weathering causes a greater change to rocks than mechanical weathering.
    - Because chemical weathering forms completely new, different matter, while mechanical weathering breaks down rocks only.
14. Sometimes you can see erosion happening.
    - Because sometimes we can see flash floods, hurricanes, or landslides.
15. Gravity is one of the eroding factors.
    - Because gravity pulls rocks down mountainsides.
16. Erosion and deposition are linked processes.
    - Because eroded rocks must be deposited over time.
17. The formation of a delta.
    - As a result of the deposition process when a river meets a sea.

4 What Happens if...? Concept 1

1. The waves hit a sandcastle?
    - The sandcastle will be gone (disappeared).
2. Water runs over rocks?
    - Water will dissolve some minerals in rocks.
3. Oxygen in our atmosphere reacts with iron in the rock?
    - A red-colored rust will be formed, so rocks are broken down more easily.
4. The continuous melting and freezing cycle of water inside rocks cracks?
    - Water expands, causing the cracks in the rocks to become wider, so the rocks break off.
5. Acid rain falls on rocks?
    - Acid rain will dissolve the minerals in rocks, so they become weaker and break down easily.
6. Lichens grow on the rocks?
    - They produce acids that can break off rocks.
7. A plant's root grows inside rocks?
    - The cracks become wider so rocks break down easily.
8. Rain falls on a hilly farmland?
    - Rain will carry the weathered rocks and soil on farmlands.
9. Wind stops blowing (concerning the process happening to sand)?
    - The deposition process will happen.
10. A river carrying sediments meets a sea?
    - The deposition process happens and a delta may be formed.

5 Revision on Concept 1

1 Choose the correct answer:

1. Steep valleys formed due to flowing water erosion are called ....
   a. hills b. sand dunes c. canyons d. deltas
2. A canyon may take .... to be formed.
   a. minutes b. hours c. days d. years
3. All the following are reasons for chemical weathering, except ....
   a. water b. plant roots c. acid rain d. oxygen gas
4. .... may cause chemical or mechanical weathering.
   a. Lichens b. Oxygen c. Water d. Rocks
5. Which of the following examples represents mechanical weathering?
   a. Red-colored rust on rocks b. Acid rain falls on rocks.
   c. Roots grow inside rocks. d. Water dissolves minerals.
6. Sand is formed due to the breaking down of ....
   a. wood b. plastic c. glass d. rocks
7. Limestone caves are formed due to the combination of ....
   a. dissolved minerals b. insoluble minerals
   c. red-colored rust d. acid rain
8. .... is the process by which sediments are carried to another place.
   a. Deposition b. Erosion c. Weathering d. Melting
9. Dissolving minerals from rocks to recombine with new substances is an example of ....
   a. mechanical weathering b. weathering by wind
   c. chemical weathering c. erosion
10. All the following are processes that change the Earth's surface, except ....
    a. erosion b. digestion c. weathering d. deposition
11. Lichens produce .... that dissolve(s) minerals found in rocks.
    a. oxygen b. rain c. water d. acids

12 The process of breaking down rocks on the Earth's surface is called ....

a. erosion b. weathering c. decomposition d. deposition

13 The force of .... pulls rocks from the top of the mountain to its bottom.

a. river water b. seawater c. rainwater d. gravity

14 .... erode(s) rocks and soil from their banks.

a. Rivers b. Mountains c. Rainwater d. Gravity

15 When a river carrying sediments meets a sea, a .... is formed.

a. sand bar b. sand dune c. delta d. sand pile

16 Gentle wind can carry sand grains for .... distances.

a. short b. long c. huge d. very long

2 Put (✓) or (✗):

1 The Earth's surface changes from time to time. ( )

2 All changes to the Earth's surface take hundreds of years. ( )

3 Canyons take millions of years to be formed. ( )

4 The Earth's surface never changes. ( )

5 The deposition process takes place before the erosion process. ( )

6 We can see weathering in action everywhere around us. ( )

7 Plant roots help in the formation of rocks. ( )

8 Rocks become stronger when iron found in them rusts. ( )

9 Wind is one of the agents that cause weathering. ( )

10 Chemical weathering causes greater changes to rocks than mechanical weathering. ( )

11 Sometimes you can see erosion happening. ( )

12 The deposition process never changes the shape of the Earth's surface. ( )

13 The formation of sand dunes in the Eastern Desert in Egypt is due to the movement of the wind. ( )

14 Floods are one of the factors that cause water erosion. ( )

15 The erosion process is usually followed by the weathering process. ( )

3 Write the scientific term:

1. They are deep valleys carved by the flowing water. (..........)
2. It's the process of moving rocks from one place to another. (..........)
3. It's the process of laying sediments down. (..........)
4. It's the kind of weathering that changes the structure and color of rocks. (..........)
5. They are tiny, like plants, that live on rocks and produce acids on them. (..........)
6. It is the gas that causes the red-colored rust on some rocks. (..........)
7. It is a type of weathering that occurs in rocks and leads to the formation of a completely different material. (..........)
8. It is a type of weathering that breaks rocks down without changing their matter. (..........)
9. It is an eroding factor that pulls rocks down mountainsides. (..........)
10. It is an eroding factor that moves rocks from their banks downstream. (..........)
11. It is the process that lays sand down when the wind stops blowing. (..........)
12. It is a landform of deposited sediments formed when a river meets a sea. (..........)

4 Complete the following using the words between the brackets:

A (Mechanical - Acid rain - chemical - oxygen - Acids - iron - plant roots)

1. The melting and freezing cycles of water have the same effect as ...., as they make the cracks in the rocks wider.
2. .... produced by lichens may dissolve rocks.
3. .... has the same effect of lichens on rocks.
4. .... weathering and .... weathering are types of weathering.
5. When the .... in air reacts with .... in rocks, a red-colored rust is formed.

B (water - Nile Delta - hurricane - deposition - gentle wind - Egyptian Western Desert)

1. A .... forms a small sand dune, while a .... forms large sand dunes like that in the ....
2. .... is a fan-shaped mass of mud and sediments.
3. Wind, ..., and gravity are natural factors that control erosion process.
4. The process of laying down sediment after its erosion is called ....

5 Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
1 Lichens	a. causes mechanical weathering of rocks.
2 Water	b. causes the red-colored rust on a toy car.
3 Oxygen	c. produce acids as they grow on rocks.
4 Melting and freezing	d. may cause both types of weathering.

1 .... 2 .... 3 .... 4 ....

6 Study the following figures, then complete the following sentences:

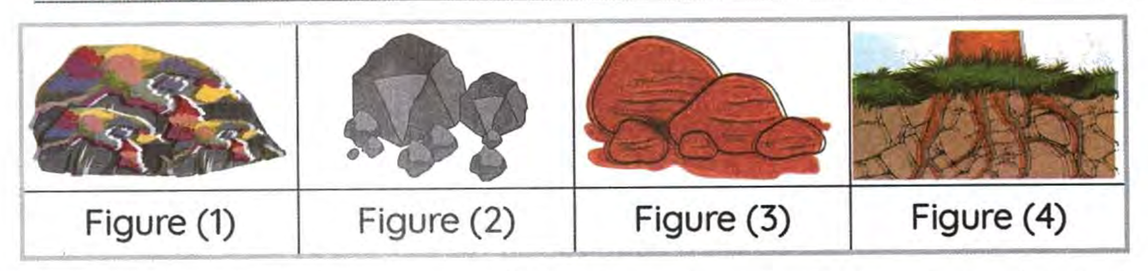


Figure (1) Figure (2) Figure (3) Figure (4)

1. Figure (..........) represents a living organism that causes mechanical weathering.
2. Figure (..........) represents a living organism that causes chemical weathering.
3. Oxygen gas has a bad effect on rocks in figure (..........).

7 Give reasons for:

1. The Earth's surface is always changing.

....

2. Oxygen in the atmosphere has a bad effect on some rocks.

....

3. Lichens dissolve rocks as they grow.

....

4. Chemical weathering causes greater changes to the rocks.

....

5. Erosion and deposition are linked processes.

....

8 What happens if?

1. Oxygen gas reacts with iron rocks, forming a red-colored rust?

....

2. Acid rain falls on rocks?

....

3. The lichens that grow on rocks produce acids?

....

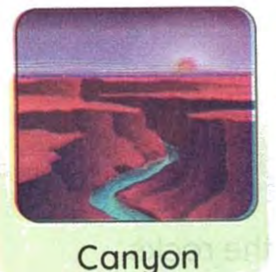
4. Plant roots grow inside rocks' cracks?

....

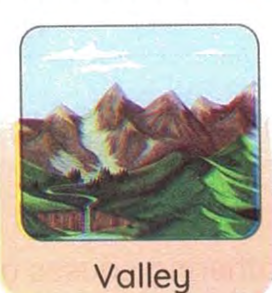
Concept 2 Changing Landscapes

1 Summary of Concept 2

- Many factors can change the Earth's surface and form new landforms, such as:


Canyon


Sand Dune


Valley


Delta

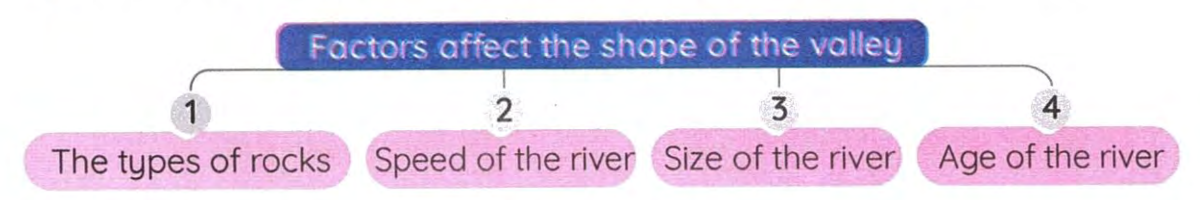
1 Canyons:

They are special types of valleys carved by flowing water.

Processes	Weathering and erosion
Factors	Water, wind, and other factors
Age	Canyons take millions of years to be formed.
Properties	• The sides are steep. • Walls are narrow and vertical. • They usually consist of many layers.

How are canyons formed?

1. Gravity pulls rainwater downhill, forming small streams.
2. Small streams are joined together to form a bigger stream (river).
3. The water of the river moves fast and erodes rocks in its pathway.
4. When a river dries after a very long time, a canyon may be formed.



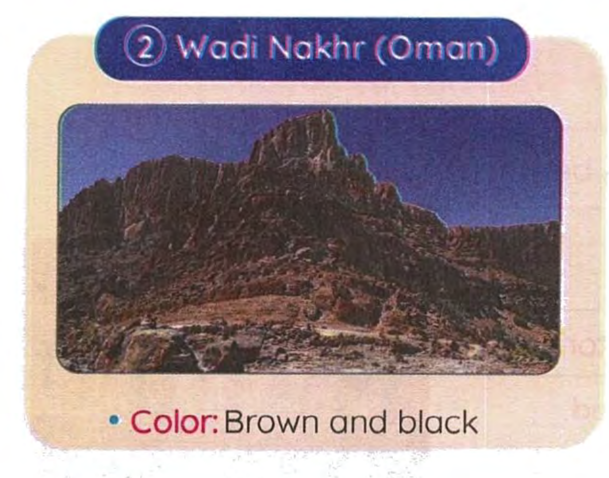
Examples of canyons and their properties

① The Grand Canyon

- The Grand Canyon is the largest canyon in the world.

Location	United States of America
Age	It is millions of years old.
Shape	• It is very large and steep. • It contains many layers of rocks. • There is a river at the bottom.

② Wadi Nakhr (Oman)



- Color: Brown and black

③ Small Canyons (Thiland)



- Color: Reddish

④ Wadi Rum (Jordan)



- Color: Reddish
  V-Shaped

⑤ Colored Canyon (Sinai)



- Color: Reddish
  V-Shaped

- **When water is moving over the sand,**
  it pushes some of the sand away and leaves an impression.



- **Small canyon:**

How is it formed?	A stream of water may have formed it.
What is your evidence?	• There are trees and plants on both sides. • The sides are gently sloped
What happens if it rains a lot on it?	It will become deeper.

2 Valleys:

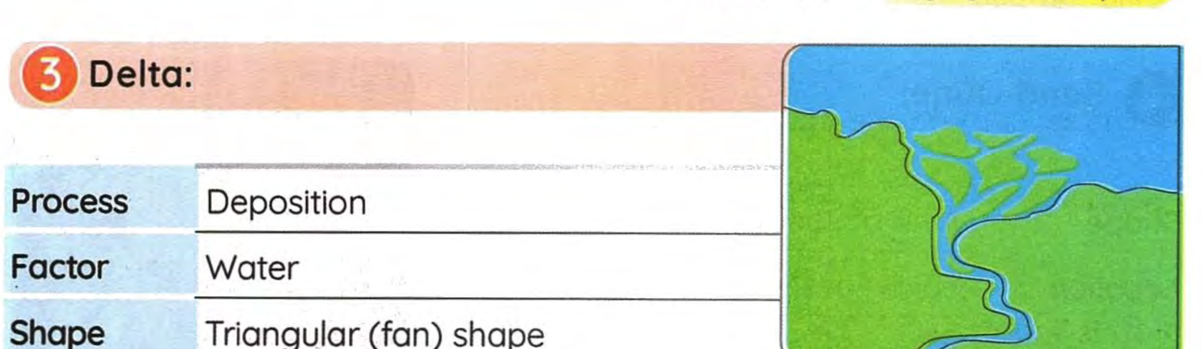
They are lowland areas between mountains.

Processes	**Weathering** and **erosion**
Factors	**Water**, **wind**, and **other factors**.
Properties	• The sides are **gently sloped**. • They are usually surrounded by a **wide**, **flat plain**.

Similarities between canyons and valleys

- They are formed by rivers or streams.
- They often have rivers or streams flow in the bottom.

3 Delta:



Process	Deposition
Factor	Water
Shape	Triangular (fan) shape

How is delta formed?


1. Fast-moving rivers carry sediments called **silt**


2. The water of the river is full of sediment that has been collected along the journey.

> Silt is made up of very fine bits of **sand**, **clay** or **rock materials**


3. When the **rapid flowing water** "of the river" enters **still water** "lake", or **slower water** "ocean or sea", water loses energy and drops the sediment that it is carrying, forming a **delta**

- **The wetland of plants in the delta helps in increasing deposition**
  Because they are responsible for slowing down the water in the river.

The Nile River Delta

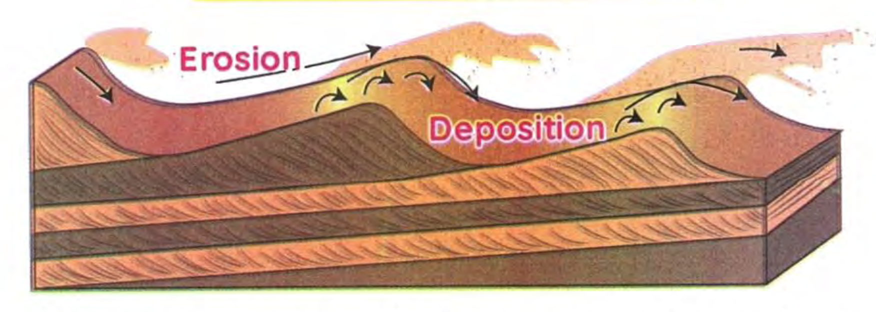
"The most famous delta in the world".

Area	It covers over **20,000 km²** in Egypt.
Location	Lies between Cairo and the Northern coast of Egypt.
Importance	It is characterized by the presence of **fertile soil** that allows the cultivation of different types of crops.

4 Sand Dune:

Shape	A hill of sand
Location	Sandy desert or sandy beach
Area	• They are found in groups. • They may cover a large area. (Hundreds of meters tall).
Processes	Erosion and deposition
Factors	Wind-blown sand
How they are formed?	Sand dunes are formed when a barrier like a rock blocks the wind-blown sand.

Sand Dunes Movements

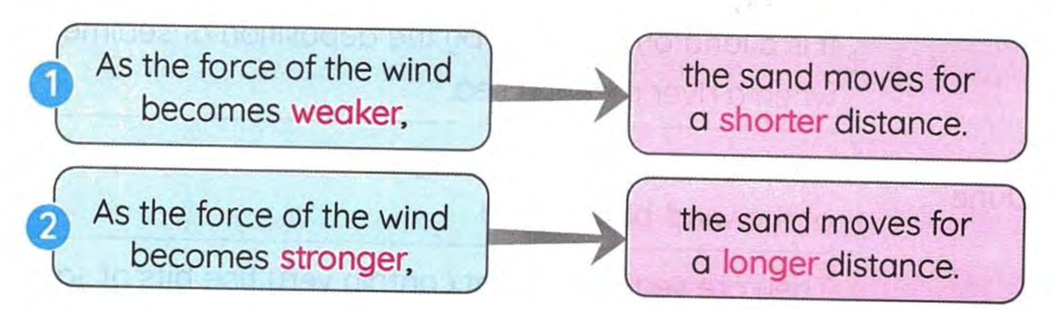


- Dunes are interesting because they are constantly moving, as follows:

1. When wind blows across a dune, it erodes away the sand grains from the side it blows.
2. The grains of sand are carried up by the wind along the slope of the dune.
3. When they reach the top, the dune forms a barrier to the wind. So, the sand grains roll down the other side.

Wind Erosion

- The wind in the desert can be a powerful force of change.
- Wind and sand work together to erode rocks.
- The **distance** that the sand grains move depends on the **force** of the wind.



- The **way** the sand moves depends on the **direction** of the wind.

Steps of Erosion by Wind

1. **When wind blows across the land,** it picks up sand and other rock particles and carries them along.
2. **When this flying sediment hits a rock,** it wears down that rock like a sandblaster.
3. **This process carves the rock into strange shapes.**

Recognizing signs of weathering, erosion, and deposition is very useful.

Because it helps us build houses in safe places, where:

1. People must not build a house on a hill that is eroding.
2. People must not build a house very close to a river.



2 Definitions of Concept 2

Valleys	They are lowland areas between mountains.
Canyons	They are special types of valleys with steep sides.
Delta	It is a landform formed by the deposition of sediments when a river meets a sea.
Sand Dune	It is a hill of sand created by the erosion and deposition of the wind-blown sand.
Slits	They are sediments that contain very fine bits of sand, clay, or rock materials.

3 Give Reasons for... Concept 2

1. You must avoid building a house on a hill and exposing it to erosion.
   - Because the river may change its path and cause erosion and deposition of the house.
2. There are similarities between valleys and canyons.
   - Because both of them were formed by flowing water.
   - Because they may have rivers or streams flowing through their bottoms.
3. A delta is formed when flowing water enters still water.
   - Due to the deposition process, as water loses energy and drops its sediments forming a delta.
4. The roots of plants increase the deposition of rivers' sediments.
   - Because the roots of plants slow down the water movement, which increases the rate of the deposition process.
5. Delta allows the cultivation of different types of crops.
   - Because it has fertile soil.
6. Sand dunes are constantly moving.
   - Due to the force of the wind.

4 What Happens if...? Concept 2

1. Streams of water flow over flat land?
   - They may form small canyons where they flow.
2. It rains a lot in a small canyon?
   - This small canyon will get deeper.
3. Small streams of water join together?
   - It will form a river, which causes more erosion.
4. The wind blows across a sand dune?
   - Sand grains are eroded away from the side of the wind coming from.
5. Wind-blown sand hits a big rock?
   - Sand is deposited, forming a sand dune.
6. The force of the wind carrying sand increases?
   - Wind will move sand grains for a longer distance.
7. The direction of the wind changes?
   - The way the sand moves changes.

5 Revision on Concept 2

1 Choose the correct answer:

1. A canyon may take .... of years to be formed.
   a. hundreds b. tens c. millions d. couple
2. Canyons can be formed in many ways, including ....
   a. weathering only b. erosion only
   c. weathering and erosion d. erosion and deposition
3. If the rain falls over a canyon several times per year, ...
   a. its depth increases b. its depth decreases
   c. it becomes flat d. not be affected
4. The shape of a rock gets worn and rounded by the effect of the .... process.
   a. weathering d. deposition c. erosion d. photosynthesis
5. .... is/are evidence of deposition.
   a. A rounded, worn rock b. A patch of sand on the ground
   c. An area with canyons d. Red-colored rocks
6. A river may make a new .... at its end through the .... process.
   a. mountain, deposition b. canyon, erosion
   c. land, deposition d. land, weathering
7. .... pulls rainwater downhill, forming small streams.
   a. Magnetism b. Gravity c. Sunlight d. Wind
8. All the following factors affect the shape of the valley, except ....
   a. the river's size b. the river's speed
   c. the rocks' type d. the rocks' color
9. A .... is a deep valley with high, steep sides.
   a. hill b. mountain c. canyon d. dune
10. .... are lowland areas with gently-sloped sides.
    a. Valleys b. Deltas c. Canyons d. Dunes
11. When a river meets a sea or an ocean, a landform known as a .... is formed.
    a. canyon b. volcano c. mountain d. delta

12 All the following are created by the water of rivers or streams, except ....

b. deltas b. canyons c. valleys d. sand dunes

13 Silt carried by water contains all the following, except ....

a. sand b. clay c. rocks d. glass

14 A sand dune is formed by the ...... process, then the ...... process.

a. deposition, erosion b. erosion, weathering

c. erosion, deposition d. deposition, weathering

15 Which of the following factors helps in the formation of sand dunes?

a. Water b. Wind c. Light d. Heat

16 When a rock blocks the path of flying sand, a .... may be formed.

a. dune b. river c. canyon d. delta

2 Put (✓) or (✗):

1 Wadi Rum in Jordan is an example of a sand dune. ( )

2 All canyons have the same shape, texture, and color. ( )

3 The sides of the canyon at the beginning of its formation are gently-sloped. ( )

4 Understanding the formation of landforms helps us predict future changes of landforms. ( )

5 It is better to build your house on a hill that is eroding. ( )

6 A river never changes its path, so it's safe to build a house near any river. ( )

7 When a river moves down a steep slope, its speed decreases. ( )

8 Most valleys are formed due to the erosion of many sediments and their transfer far away. ( )

9 The shape of the valley depends on the type of its rocks. ( )

10 A slow-moving river has a lot of energy, so it causes more erosion. ( )

11 A delta is formed when the speed of the river water increases. ( )

12 Silt carried by a river contains large bits of sand and clay. ( )

13 Sand dunes are formed when a rock blocks water-blown sand. ( )

14 Sand dunes are formed by the deposition process only. ( )

15. The formation of sand dunes in the Eastern Desert in Egypt is due to the movement of wind. ( )
16. Dunes are formed at the bottom of seas. ( )

3 Write the scientific term:

1. It's a deep valley that formed due to the weathering and erosion of wind and water. (..................)
2. It's a force that pulls rainwater downhill, forming small streams.(..................)
3. It's the world's largest canyon, located in the USA. (..................)
4. They are often found at the bottom of both canyons and valleys. (..................)
5. It's a sediment carried by a river that contains sand, clay, and rock materials. (..................)
6. It's a fan-shaped land that is formed when a river meets a sea. (..................)
7. It's a process that causes the carving of rocks into different shapes by wind-blown sand. (..................)

4 Complete the following using the words between the brackets:

A (small canyon - impression - V-shaped - water stream - brown and black-colored)

1. When the rain falls on a flat sandy land, it will leave an ....
2. Wadi Nakhr is a .... canyon.
3. Wadi Rum and colored canyon in Sinai are .... canyons.
4. In the beginning of a .... formation, plants and trees grow at the two sides of it due to the effect of the ....

B (less - high - more - gravity - increases - sediments - many layers)

1. Rainwater is pulled downhill, forming a small stream due to ....
2. When the water of a river moves downhill on a steep slope, the water speed ...., which causes .... erosion.
3. A small stream causes .... erosion than a large river.
4. The force of rushing water erodes a lot of .... of a mountain and carries them away.
5. Walls of canyons are very .... and are composed of many ....

C (deposition - canyon - fan - decreases - increases - delta)

1. A .... is formed by the erosion process, while a .... is formed by the deposition process.
2. The Nile River Delta has a .... shape.
3. When the stream water speed ...., it causes .... of sediments.
4. When the force of blowing wind ...., the blown sand is carried for a longer distance.

5 Choose from column (A) what suits it in column (B):

A

Column (A)	Column (B)
1 Wadi Nakhr	a. is a black and brown canyon in Oman.
2 Wadi Rum	b. is a V-shaped canyon in Jordan.
3 Small canyon	c. is a reddish canyon in Thailand.

1 .... 2 .... 3 ....

B

Column (A)	Column (B)
1 Erosion	a. is the fine particles of clay, sand, and rock materials.
2 Deposition	b. occurs when a stream water rushes quickly downhill a mountain.
3 Sand dunes	c. are hills of sand usually seen in groups and they may cover large areas.
4 Silt	d. occurs when a stream water speed slows down at the end of a river.

1 .... 2 .... 3 .... 4 ....



6 Cross out the odd word:

- Mountain - Valley - Gravity - Canyon (..................)

7 Study the following figures, then put (✓) or (✗):

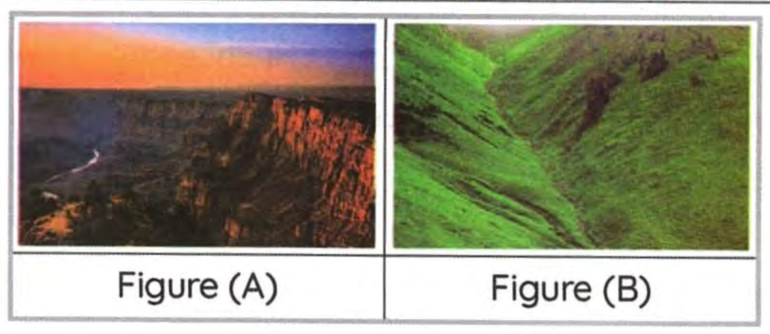
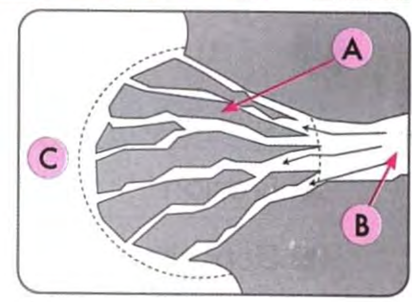


Figure (A)	Figure (B)

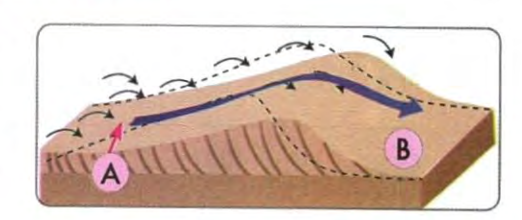
1. The landform in figure (A) has gently-sloped sides. (   )
2. The landform in figure (B) may be surrounded by some plains between mountains. (   )
3. Both landforms are formed due to erosion carried by rivers. (   )
4. The walls of the landform in figure (A) are higher than those in figure (B). (   )

8 Study the following figure, then choose the correct answer:



1. The area (A) would become a .... (delta – canyon) due to the .... (erosion – deposition) process.
2. The .... (area "C" – area "B") could be a sea or a lake.
3. The .... (area "C" – area "B") is a river.

9 Study the following figure, then complete:



1. The erosion of sand occurs in area ....
2. The deposition of wind-blown sand occurs in area ....

10 Give reasons for:

1. It is not safe to build a house close to a river.

....

2. Valleys and canyons are formed in the same way.

....

3. Sand dunes are formed in a desert.

....

11 What happens if?

1. A water stream flows over a flat land?

....

2. A lot of rain falls on a small canyon?

....

3. Small streams of water are joined together? (concerning erosion)

....

4. A river carrying sediments meets a sea?

....

5. Wind-blown sand grains hit a big rock in the desert?

....

Worksheet (1)

- **Choose the correct answer:**

1. Toy cars need energy to do all the following functions, <u>except</u>...........
a. moving forward and backward. b. rotation in a circle
c. moving right and left. d. rotation around the moon.

2. In the battery of a toy car .... energy changes into electrical energy
a. chemical b. sound c. light d. thermal

3. Electrical energy produced from a toy car battery can be changed into ....and .... energies.
a. mechanical - sound – solar b. mechanical - thermal - solar
C. mechanical - sound – thermal d. sound - thermal - solar

4. The energy source in a toy car is the ....
a. engine. b. tires. c. battery. d. fuel

5. It takes several........... for a spacecraft to travel from Earth to Mars.
a. months b. seconds c. minutes d. days

6. Curiosity rover is designed to explore.
a. the moon. b. the Sun. c. Earth planet. d. Mars planet.

- **Correct the underlined words:**

1. The solar energy produced from the <u>moon</u> can be converted into different forms of energy. (.........................)
2. Toy cars depend on <u>fuel</u> as a source of electrical energy. (.........................)
3. Curiosity is a robotic vehicle that is designed to explore the surface of <u>moon</u>. (.............................)

- **Complete the following sentences :**

1. The energy can be ………… From one form to another.
2. Remote controlled toy cars changes……………….energy stored in its batteries into……….. energy that in turn changes into………………. energy which is used to Move the car.
3. To operate an electric mixer we use …………… ………Energy.
4. When your cell phone is out of charge, you must rechange its……………To operate it again.
5. Some calculators can change solar energy into……………………Energy by using the Sunlight.

- **Put (✓) or (x) :**

1. Energy cannot be transformed from one form to another. (   )
2. We can convert the solar energy into different forms of energy. (   )
3. We can continue to move a toy car even after its battery runs out. (   )
4. Curiosity is a vehicle that travels across the surface of the planet Mars. (   )
5. Mars is located a few meters away from Earth. (   )
6. Without electrical energy, Mars rover curiosity cannot move or communicate With Earth. (   )

- **Give reasons for:**

1. Some calculators use the sunlight to be operated.
   ……………………………………………………………………………………
   ……………………………………………………………………………………
2. A remote controlled toy car needs battery to move from one place to another.
   ……………………………………………………………………………………
   ……………………………………………………………………………………

Worksheet (2)

- **Write the scientific term for each of the following:**

1. The main source of energy for most forms of energies on Earth.(……………………….)
2. The energy produced when the wood of trees is burned. (……………………….)
3. It is produced from the remains of dead trees buried under the Earth's surface over millions of years. (……………………….)
4. The energy that is used to operate an electric heater. (………………………….)
5. The energy stored inside the coal. (…………………………)

- **Complete the following sentences by using the words from brackets:**
  (electrical – kinetic -sun – light – thermal – kinetic – potential – sound – heat – kinetic – thermal)

1.The energy that is produced from the battery used to operate a toy car is …………..

2. When you press on the soap dispenser, you turn the ………….. energy stored in its spring into…………. energy that moves the soap upward.
3. The energies that are produced from the washing machine are…………… energy and …….. energy.
4. When you rub your hands together, the ………….. energy is converted into………..energy.
5. In any energy chain, some of the energy is lost in the form of…………..
6. The electric lamp converts electrical energy into . ... energy and …. ……… energy.
7.The……………… is the primary source of energy that is transferred to the food in the
Form of chemical energy.

- **What happens if…?**

1) You burn a piece of wood. (according to the change of energy).

   ……………………………………………………………………………………….
   ……………………………………………………………………………………
2) You shake a small bell with your hand. (according to the change of energy).

   ……………………………………………………………………………………….
   ……………………………………………………………………………………….

- **Put (✓) or (x):**

1. In the soap dispenser, potential energy changes into kinetic energy. ( )

2. In the electric blender, sound energy changes into electrical energy and kinetic energy. ( )

3. Most of energy chains starts with the moon. ( )

4. Light energy from the Sun causes trees to grow. ( )

5. Both hair dryer and washing machine depend on the same kind of energy to be operated. ( )

6. In the electric power stations, the sound energy produced from burning of coal can be changed into electrical energy. ( )

7. There is energy loss when energy is transformed from one form to another. ( )

8. Energy can be destroyed inside some devices. ( )

9. Electric bulb depends on chemical energy to be operated. ( )

10. Both electric bulb and electric heater produce thermal energy. ( )

Worksheet (3)

- **Write the scientific term for each of the following:**

1. The energy produced from playing guitar. (……………………………)
2. The energy produced from the electric lamp and affects our eyes. (……………………………….)
3. The energy used to play a drum.   (……………………………….)

- **Choose the correct answer:**

1. In the electric water kettle, the electrical energy changes into............... energy that can warm the cold water inside it.
   a. sound.   b. thermal.   c. light   d. kinetic.
2. Some kinetic energy is converted into………….energy due to friction of bike's tire With the road.
   a. light   b. electrical   c. potential.   d. thermal
3. Both hair dryer and electric water kettle produce…………… energy
   a. Chemical   b. thermal   C. light   d. potential
4. When you turn on a light bulb, the electrical energy travels through. ....until reaching the bulb.
   a. wires.   b. glass   c.wood   d.plastic.

- **Complete the following sentences:**

1. When you ride a bicycle, the …………….energy stored in your body is converted into……………. Energy which causes the bicycle to move.

2. The electric lamp converts.............. energy into light energy and................energy.

3.The change of electrical energy into sound energy in the radio is an example that proves the law of ……………………

- **Give reasons for**

  1.You feel heat, when you put your hands near a lighted electric lamp.

  ………………………………………………………………………………………………

  ………………………………………………………………………………………………

  2- The presence of batteries inside a toy car.

  ……………………………… ……………………………………………………………

  ………………………………………………………………………………………

- **What happens if……?**
  - You put your hands near the lighted lamp .

  ………………………………………………………………………………………………

  ………………………………………………………………………………………………

Worksheet (4)

- **Put (✓) or (x) :**

1. The produced sound energy helps the hair dryer to do its function. (   )
2. In waterfalls, the water that falls down has a kinetic energy.(   )
3. The input energy in a hair dryer is the chemical energy. (   )
4. The energy chain of a burning candle is :Chemical energy converted into Thermal energy. (   )

- **Write the scientific term:**

1. The wasted energy when using a mobile phone for a long time. (.......................)
2. A kind of energy that is produced from the electric heater and burning coal. (...........................)
3. The energy that is produced from the blender and helps it in doing its job. (............................)
4. The energy that is produced from the electric power stations and flows through wires. (.............................)

- **Choose the correct answer:**

1. The input energy when using the hair dryer is the .... Energy.

a. electrical   b. potential   c. kinetic   d.thermal

2. During the running of a player, the chemical energy inside his body is converted Into .... and............energies.

A. potential-light.   B. kinetic- light.   C . thermal- kinetic.
D. thermal – light

3. The output energy when playing drums is the .... energy.
   a. chemical   b. light   C. sound.
   d. potential
4. When a piece of coal is burnt,....................... Energy is produced.

a.Thermal   b. Kinetic   c. Sound   d. Potential

- **What happens if… ?**

1- You turn on an electric fan. (according to the change of energy).

………………………………………………………………………………………………………
………………………………………………………………………………………………………

2- use a mobile phone for a long time. (according to the wasted energy).

………………………………………………………………………………………………………
………………………………………………………………………………………………………

- **Give reasons for:**

- Thermal energy in mobile phone is considered as a wasted energy.

………………………………………………………………………………………………………
………………………………………………………………………………………………………

- Sound energy and thermal energy are considered as wasted energy in the blender.

………………………………………………………………………………………………………
………………………………………………………………………………………………………

Worksheet (5)

- **Correct the underlined words :**

5. Fuel is the substance that produces electrical energy on burning.
   (……………………….)
6. We need sound energy, for cooking foods and warming houses.
   (…………………………)

- **Put (✓) or (x) :**

5. Both coal and wood produce energy on burning them. (   )
6. You need gasoline to move a bicycle.   (   )
7. We cannot drive a car that doesn't contain fuel . (   )
8. As the speed of the car increases, the amount of used fuel decreases. (   )

- **Choose the correct answer:**

1- We can use the energy obtained from burning of wood in all of the following situations, except ……………

a. warming houses.   b. operating television.   C. cooking food
d. boiling water.

2- All the following are found deeply under the Earth's surface, except…………….

a. Natural gas.   b. Coal.   c.Green plants.   d.Oil

3- Among forms of fuel that present in car fuel stations are………..

A. Gasoline and wood.   B. natural gas and coal.

C. wood and coal.   D. gasoline and natural gas.

- **Complete the following sentences :**

1) Gasoline burns inside a car engine to produce………………. energy that is changed Into………………..energy which causes the movement of the car.
2) We can use some forms of fuel such as………...and……………in warming houses.

- **Give reasons for:**

- fuel is very important for different means of transportation

………………………………………………………………………………………………………

………………………………………………………………………………………………………

-Sometimes the fuel indicator of a car goes down.

………………………………………………………………………………………………………

………………………………………………………………………………………………………

-Gasoline burns inside a car engine.

………………………………………………………………………………………………………

………………………………………………………………………………………………………

Worksheet (6)

- **Choose the correct answer**

1. All the following are forms of fuel, <u>except</u>………………

   A. wood. b. natural gas. C. gasoline. d. glass.

2. All the following are renewable resources of energy, except………

a. natural gas b. water. C. the Sun. d wind.

3.Coal is formed under the Earth's surface……….. from the remains of

A. dead animals. b. dead plants. C. dead humans. d. dead insects.

4.Wood is considered as………..

a. biofuel. b. fossil fuel. C. liquid fuel. d.gaseous fuel.

5.Extreme heat and pressure under the Earth's surface has an important role in Forming.

a. wood. b. wind. C. Fossil fuel. d.biofuel

- **Complete the following sentences**

1. Water and………………are considered from…………. resources of energy, while Coal and……..,………..are from non-renewable resources of energy.
2. Wood chips and grass can be used to make a …………….….. biofuel .
3. Different forms of fuel can be classified into two main types which are …...............and.............
4. The natural resources that are consumed at a rate faster than they can be Renewed are called……………. ……….Resources of energy.

- **Correct the underlined words:**

1. We have to increase planting vegetables and fruits that need a large amount of water.(……………………….)
2. The moon is the primary source of both biofuel and fossil fuel.(…………………………….)
3. We can use some animals, to make a liquid biofuel. (………………………….)
4. The rate of consumption of fossil fuel, must be increased. (…………………………….)
5. Wood is a form of fossil fuel, that can be used in houses. (…………………………….)

- **Put (✓) or (X) :**

1. Biofuel is one of non-renewable resources of energy. ( )
2. Extreme cooling under the Earth's surface, helps in the formation of oil . ( )
3. The Sun is the primary source of forming both biofuel and fossil fuel. ( )
4. We have to reduce the usage of the Sun as a source of energy. ( )
5. We can make a liquid fuel from grass and wood chips. ( )

- **Read the following paragraph, then choose the correct answer :**

Nowadays , we use gasoline and natural gas in means of transportation which are
considered fossil fuels, while we can use coal which is a fossil fuel and also wood
which is a biofuel in warming our houses.

1.………………..is a non-renewable resource of energy, that is considered as a fossil fuel
And it is not used in means of transportation nowadays.

A. Water. B. Coal C. Wind d. Gasoline

2. A type of biofuel, which is used in warming houses and cooking food is ………….

a. wood b. wind. C. water. d. sand.

3. A type of fossil fuel, which is formed from decomposition of plant remains is ....

A. wood   b. sand.   C. wind.   d. coal.

Worksheet (7)

- **Put (✓) or (X) :**

1. We have to conserve all forms of fuel. (   )
2. Burning of fossil fuel inside electric power station produces Potential energy.   (   )
3. Turning off lights that we do not need, is a way to conserve electricity.   (   )
4. Any form of fossil fuel must be formed under the Earth's surface. (   )

- **Arrange the following steps to show how electricity is generated in electric Power station and sending it to houses and factories:**

(……….)Steam turns turbines that produce kinetic energy.
(……….)Fuel burns and produces thermal energy.
(……….)Electrical energy sent to houses and factories.
(……….)Water becomes hot and produces steam.
(……….)Turbines turn generator that produces electrical energy.

- **Write the scientific term:**

1-The matter that produces steam on heating, which is used to turn turbines in Electric power station. (…………………………)

2-The type of fuel that is used inside the electric power station to produce Electricity . (……………………….)

3-The device in the electric power station, that produces kinetic energy to operate Generators. (…………………………)

- **Correct the underlined words:**

1. Fossil fuel include oil, coal and wood. (…………………….)
2. Hydroelectric energy, is one of non-renewable energy resources. (……………………….)
3. In electric power station, water turns turbines that produce kinetic energy.   (………………………….)

4. After death of living organisms, their remains are buried under the Earth's surface and exposed to
5. extreme pressure and cool.(…………………………)

- **Choose the correct answer:**

1. Inside the electric power station, heating of ……….. produces steam.
   A. turbines b. generators C. water d. fuel
2. All the following are used to generate electrical energy, except……….
   A. Oil .B. natural gas. C. waterfalls. D. rain water.

3.Hydroelectric energy is generated from. ……………
a. waterfalls only. B. waterfalls and dams.
C. biofuel only. d. biofuel and fossil fuel.

4. All the following are forms of fossil fuel, except ………….
a. water. b. coal. C. natural gas. d. oil.

5.Which of the following forms of fuels can be manufactured by man?
A. Oil and natural gas. b. Oil and charcoal.
C. Natural gas and ethanol. d. Charcoal and ethanol.

6.All the following factors play an important role in the formation of fossil fuel, except …………….
A. extreme pressure. b. extreme heat.
C. The moon light. d. rocks and sediment.

Worksheet (8)

- **Choose the correct answer :**

1.Cars smog cause irritation of……… of humans.

a. stomach and eyes b. eyes and lungs c. small intestine
d. large intestine

2. Acid rain is formed when………..Combines with rain water.
A. oxygen gas b. carbon dioxide gas C. dust
d. sand

3. All the following are harmful effects of acid rain, except.
a. global warming. b. death of trees.
c. chemical changes in lakes. d. chemical changes in the soil.

- **Complete the following sentences by using the words :**
(Acid - Fish - soil - carbon dioxide – smog)

1. Acid rain leads to chemical changes in the structure of lakes causing death of ………………..
2. Burning of coal and oil produce …………………… gas .
3. Chemical changes in the structure of…………………Due to………….Rain .
4. Tiny particles found in …………………lead to air pollution .

- **Put (✓) or (X):**

1.Acid rain helps trees to survive. ( )

2. Global warming increases the decomposition of some rocks . ( )

3. Rain water can be mixed with both pesticides and carbon dioxide gas. ( )

- **Write the scientific term of each of the following:**

1. It is the system that its tissue is damaged due to breathing big amount of cars smog. (………………………)
2. It is a phenomenon in which the Earth's temperature increases when carbon dioxide gas increases in the air. (……………………………)
3.

Worksheet (9)

- **Give one example for each of the following :**

1. A method of conserving fossil fuel.
   ……………………………………………………………………………………………………
2. Anon-renewable resource of energy.
   ……………………………………………………………………………………………………
3. An advantage of using renewable resources to produce energy.
   ……………………………………………………………………………………………………

- **Correct the underlined words:**

1. The amounts of <u>renewable resources</u> of energy are limited on Earth. (……………………)
2. Gases emitted from fossil fuel on burning <u>decrease</u> the temperature on Earth. (…………………)
3. Gases emitted from burning fossil fuel always <u>clear</u> the air. (………………………)

- **Give reasons for:**

1. To keep the air clean we must replace fossil fuel with renewable resources of Energy
   ……………………………………………………………………………………………………
   ……………………………………………………………………………………………………

- What happens if .. ?

1. Using renewable resources of energy instead of fossil fuel. (according to Earth's temperature)
   ……………………………………………………………………………………………………
   ……………………………………………………………………………………………………
2. People don't rationalize their using of fossil fuel.
   ……………………………………………………………………………………………………
   ……………………………………………………………………………………………………

Worksheet (10)

- **Choose the correct answer:**

1.All of the following are examples of renewable energy resources, except ………………

a. fossil fuel. b. waterfalls. C. wind. d. sunlight.

2. Gasoline is a non-renewable energy resource that is used inside a …………………

a. flashlight b. car engine C. electric fan d. Washing machine.

3. Some types of lamps depend on……………. ……as a renewable energy resource in order to do its function .

a. sunlight b. oil. C. coal d. natural gas

- **Correct the underlined words :**

1. Solar panels use sound energy to generate electricity. (…………………….)
2. the high cost of producing energy in windmills is one of its advantages. (…………………)
3. Manual mixer depends on electricity to do its function. (………………………….)

- Put (✓) or (X):

1. Windmill turbines generate electricity by using the energy of water flow . ( )
2. Both modern wind turbines and old windmills are used to generate electricity. ( )
3. All devices need energy to do their functions. ( )
4. Both wind movement and water flow has kinetic energy. ( )
5. The low cost of the energy used in watermills is from the disadvantages Of using this energy. ( )

Worksheet (11)

- **Write the scientific term of each of the following :**

1. The gas layer at the Sun's surface where the light we see is emitted.(…………………)

2. Huge bodies in the space made mostly of hydrogen and helium gases. (……………………)

- **Put (✓) or (X):**

1. Solar panel consists of one small solar cell. ( )
2. Plants need water only to grow. ( )
3. Looking directly at the Sun is very dangerous. ( )
4. Plants can grow if they are placed in dark areas for several weeks. ( )

- **Complete the following sentences :**

1. The Sun is necessary for the growth of ……………..Which is eaten by animals.
2. In some villages, solar panels are used to generate ……………..energy that is used To operate………………… Equipment.
3. The reaction between hydrogen and helium gases at very high temperature in the Sun produces large amounts of …….. ... energy and………..energy.

- **Give reasons for:**

1. Sunlight is very important for plants and animals.
   ………………………………,…………………………………………………………
   …………………………………………………………,……………………………
2. Sometimes the Sun is not visible in the sky but you can feel its warmth.
   ………………………………,…………………………………………………………
   …………………………………………………………,……………………………

Worksheet (12)

- **Choose the correct answer :**

1. Kinetic energy created by …………… movement is used to rotate the blades of Windmills.

A. the moon B. stars C. water. D. Wind

2.The electrical energy is transmitted from windmills to house through …………………

A. water. b. wind C. Coal. d. wires.

3. When wind..... .. .. energy increases, the windmill blades spin more quickly.

a. Kinetic b. potential. C. chemical. d. solar

4. The change of energy in an................. . is opposite to the change of energy in a wind turbine.

a. electric bell. b.electric heater. c. electric iron. d. electric fan

- **Complete the following sentences**

1. Wind is formed due to the effect of .. ……………………energy coming from the ………………….. In the Form of rays.
2. By decreasing the number of blades, the speed of rotation of turbine blades Will ………………
3. By increasing the rotation of windmill blades, the wind turbine generates more……………. energy.
4. When the wind turbines rotate, . .. …………….energy is converted into.................. energy.

- **Correct the underlined words:**

1.<u>Potential</u> energy of the wind is converted into electrical energy by wind turbines. (……………………….)

2. When air blows into the wind turbine from the <u>side</u>, the blades spin slowly. (……………………….)

3. <u>Water</u> turbines rotate when the windmill blades rotate. (………………………….)

4. The difference in temperature between cold and hot air causes air to <u>stop</u>. (……………………….)

Worksheet (13)

- **Choose the correct answer:**

1.Theason of flowing of river water downhill is the…force.

a. pushing b. friction. C. gravitational d. electrical

2. Both waterfalls and……….. are renewable energy resources.

a. wind b. coal. C. oil d. fossil fuel

3. In water turbines, the………………Energy of water is changed into electrical energy.

a. chemical b. kinetic. C.thermal d. light

- **Correct the underlined words :**

1. The <u>thermal</u> energy generated by water turbines in dams is known as hydroelectricity. (…………………………..)
2. Dams are built on rivers in order to generate <u>solar</u> energy. (…………………………)
3. The electrical energy is generated by <u>wind</u> turbines in dams. (…………………………)

- **Put (✓) or (x):**

1. Waterfalls are considered as non-renewable energy resources. ( )
2. The flow of water can be controlled to generate electricity in dams. ( )
3. Electrical energy can be generated from both waterfalls and wind movement. ( )

Worksheet (14)

- **Put (✓) or (X) :**

  1. Waterfalls are non-renewable energy resources.(   )
  2. Running water in rivers has kinetic energy. (   )
  3.The evaporated water from rivers can return back to rivers in the water cycle. (   )
  4.The energy produced from wind turbines is known as hydroelectric energy. (   )

- **Write the scientific term of each of the following :**

  1.The evaporation and condensation of river water, then returning Then returning Back to rivers through rainfalling.
  (…………………………….)
  2. A process in which water changes into water vapour.
  (…………………………….)

- **Choose the correct answer:**

  1.If The speed of moving water changes from 5m/sec. to..............m/sec, its kinetic Energy will increase.
  a. 2.   B. 3   C.4   d.6
  2. The form of energy resulted from waterfall is called……………. energy
  A. thermal.   B. chemical.   C. solar.   D. hydroelectric
  3. River water evaporates by the help of heat produced from
  A. kettles.   b. the Sun.   C. electric heaters.   D. electric iron.

Worksheet15

1-Put (✔) or (x):

1. The surface of the Earth changes from time to time.(   )

2. When large particles of rocks are broken into smaller particles, they can be carried by the moving wind.(   )

3. The water stream can break down rocks into smaller pieces.(   )

4. If you walk on the seashore and come the next day searching for your footprints, you will find them unchanged.(   )

2-Write the scientific term of each of the following:

1. The disappearance of a sandcastle as a result of its hitting with the sea waves. (……………………………………….)

2. They are deep valleys carved by flowing water.(……………………………….)

3. It is a model that can be built on seashores using sand and may disappear easily by sea waves. (……………………………….)

Worksheet (16)

1- Choose the correct answer:

1. All the following are processes that can change the Earth's surface, except……….

a. digestion. b. erosion. c. weathering d. deposition.

2. The condition of the atmosphere, including temperature, wind, and rains, is known as…….

a. weather. B. weathering. c. erosion. d. deposition.

3. Rusting of a statue is an example for the action of ………. process.

a. deposition. b. erosion

c. mechanical weathering. d. chemical weathering

4. When water freezes, it expands. This means that…………….

a. it will evaporate. b. its temperature increases.

c. its volume increases. d. its volume decreases.

2-Give reasons for

1. Iron in rocks may rust.

…………………………………………………………………………………………………..

2. Water plays an important role in the formation of limestone caves.

…………………………………………………………………………………………………..

Worksheet (17)

1-Complete the following sentences

1. Cracks caused by freezing of water and melting of ice represent……………………….weathering.

2. In the……………………… Weathering, the chemical structure of rocks doesn't change

3. Formation of limestone caves is an example of…………….weathering.

2-Put (✔) or (x):

1. Roots of plants can slowly grow over time through small cracks in rocks, causing chemical weathering(   )

2. When water freezes, its volume increases.(   )

3. The reaction between oxygen and the iron of some rocks causes its chemical weathering.(   )

Worksheet(18)

1-Write the scientific term of each of the following

1. It is the process by which natural forces move weathered rocks and soil from one place to another.(…………………………….)
2. It is the process in which weathered rocks and soil are laying down or dropped by wind, water, or gravity.(…………………………….)
3. A fan-shaped (triangular) mass of sediment that is formed where a river enters a larger body of water like seas.(…………………………….)
4. A hill of sand created by the wind. .(…………………………….)

2-Complete the following sentences

1. Wind,………………………..and gravity are natural factors that control the erosion process.

2. Sand grains……………………..on the ground when the wind carrying it stops.

3. Sediments are mixed with the remains of………………..and……………………..forming layers at the bottom of oceans and lakes.

4. Blowing of strong……………………….in the desert may form large sand dunes.

3- What happens when….?

1. More and more layers of sediments settle on the bottom of oceans, lakes, and in deserts.

   ……………………………………………………………………………………………………..

2. A river carries sediments meet a sea.

   ……………………………………………………………………………………………………..

Worksheet (19)

1-Choose the correct answer:

1. As a result of breaking down of…………….Sand is formed.

a. plastic b. rubber

c. rocks d. glass

2. A condition of atmosphere, including temperature, wind, and rains, is known as……….

a. weather b. weathering

c. deposition d. erosion

3. The breakdown of rocks, either mechanically or chemically, is known as…………….

a. photosynthesis. b. weathering.

C. erosion. d. deposition.

4. When a river meets a sea or an ocean, a…………… is formed.

a. canyon b. volcano

C. mountain d. delta

2-Put (✔) or (x)

1. The surface of the Earth never changes.( )

2. Limestone caves are formed as a result of chemical weathering.( )

3. When water freezes, its volume decreases. .( )

Worksheet (20)

Q1: Choose the correct answer:

1. A canyon may be formed due to the effect of..........

a. erosion and deposition. b. weathering and erosion.

c. weathering and deposition d. deposition only.

2.A canyon can be formed by the effect of.. ...

a. water only. b. wind only.

C. water and wind. d. water and Sun

3.A canyon may take .... of years to be formed.

a. hundred's b. tens

C. millions d. couple

4 .If the rain falls over a small canyon for several times per year........ ‘

a. its depth increase. b. its depth decrease.

C. it becomes flat. d. it is not be affected.

5. Wadi Nakhr in Oman is formed because water move................ away by the effect of erosion.

a. sunlight b. wind

C. sediments d. mountains

6 .Among canyons which has V-shape are............ .

a. Wadi Nakhr and the Small Canyon. b. the Colored Canyon and Wadi Rum. c. the Small Canyon and the Colored Canyon.

d.Wadi Nakhr and Wadi Rum.

7 .Among the evidences for the beginning of formation of small canyon by effect of running water is................

a. the deep sloped of its sides. b. trees and plants that are growing on its sides.

c. the little amount of rains that flow over it. d. the rocks and sediments that are found on its sides.

8.If the big rocks of a mountain were broken off, this is an evidence of...........

a. weathering process only. b. erosion process only.

C. weathering and erosion processes. d. weathering and deposition processes.

Q2 Write the scientific term of each of the following:

1 .It is the landform that is formed by the effect of weathering and erosion due to wind, water or other factors.

2 .The two processes that have the main role in formation of canyon.

Worksheet (21)

Q1. Put true or false:

1 .The Grand Canyon in USA is very large and steep.

2 .Rivers cause less erosion of rocks than small streams.

3 .The river movement can take the rocks away around mountains.

٤. The Grand Canyon took short period of time to be formed.

5 .Canyon is a type of dunes which has steep sides.

Q2 .Write the scientific term of each of the following:

1 .It is a special type of valleys which its sides are steep. (   )

2 .It is a very large and steep canyon which is found in United States of America .   (   )

Worksheet 22

Q1 Complete the following sentences by using the words below :

(sand – speed - deposition - rivers canyon – silt)

1 .Both of valleys and canyons often have…..............or streams flow through them lowest points.

2 .Deltas are formed when the............. of the river water decreases, which causes deposition of sediment.

3 .The plants of wetland and their roots cause increase of the rate of ....process.

4 .When the sides of a valley become steep, this valley may be changed into a.............

5.Fast flow rivers carry sediments which called........... and it is made of very fine bits of............clay or rock materials.

Q2 Give reasons for:

1. Geologists study the layers of rocks in the canyon walls
   ....
2. Plants of wetland areas help in formation of deltas
   ....

Worksheet 23

Q.1 Choose the correct answer

1 .the process of carving the rock into different shapes by wind blowing is........

a. deposition. b. weathering. c. erosion. d. transportation.

2 .Sand dunes are formed by the effect of both. .... processes

a. mechanical weathering and deposition b. erosion and weathering

C. erosion and deposition d. chemical weathering and erosion.

3.When the force of wind blowing.......... the sand travels for a longer distance

a. decreases b. becomes zero

c. doesn't change of the wind blowing. d. increases

4. Formation of sand dunes depends on...............

a. force only b. direction only

C. both force and direction d. neither force nor direction

5 .Sand dunes are common landforms between.............. environments.

a. beach and rainforest b. beach and sandy desert

C. rainforest and sandy desert d. sandy desert and oceans

6 .When a rock blocks the path of flying sand, a.............. may be formed.

a. dune b. river c. valley b. canyon

Q.2 Put (√) or (X):

1 .Wind can pick up sand grains in forming sand dunes. ( )

2 .Sand dunes are the landform that can be seen in both beach and sandy desert . ( )

3 .Sand dunes are formed by erosion only. ( )

4 .Sand travels for a short distance when wind blows with a great force.( )

5 .Sand dunes usually seen separately, and may cover a small area. ( )

6 .Wind cannot break down rocks. ( )

Worksheet 24

Q1Complete the following sentences by using the words below

(layers _sedimentary- whales – formation)

1 .Wadi Al-Hitan formed from........rocks as sandstone and limestone.

٢. Among the fossils that are present in Wadi Al-Hitan are large skeletons of................

3.At Wadi A-Hitan, the newest rocks are found at the top of the.................

٤. Geologists called each separated rook layer in sedimentary rocks a...............

Q2 Give a reason for the following

1. Geologists study the layers of sediments in rock formations،
2. The oldest rock layers of Wadl Al-Hitan contain fossils of whales.

Model answer

Worksheet (1)

- **Choose the correct answer:**
  1. d   2.a .   3.c   4.a   5. d
- **Correct the underlined words :**
  2. Sun   2-Batteries   3Mars
- **Complete the following sentences:**
  1- Changed
  2- Chemical – electrical – kinetic
  3- Electrical
  4- Battery
  5- Electrical
- **Put (✓) or (x) :**
  1- (X)   2-(✓)   3-(X)   4- (✓)   5- (X)   6- (✓)
- **Give reasons for:**
  1. Because sunlight is converted into electrical energy.
  2. Because the chemical energy stored in battery is converted into electrical energy in turn changes into kinetic energy.

Worksheet (2)

- **Write the scientific term:**
  1. The sun .   2.Thermal energy.   3. Coal.
  4. Electrical energy.   5. Chemical energy.
- **Complete the following sentences by using the words from the brackets:**
  1- Electrical
  2- Potential – kinetic
  3- Kinetic – sound
  4- Kinetic – thermal
  5- Heat
  6- Light- thermal

7- Sun

- **What happens if…?**

1.The chemical energy is converted into thermal energy and light energy.

2.The kinetic energy converted into sound energy.

- **Put (✓) or (x) :**

1- (✓) 2-(X) 3-(X) 4-(✓) 5-(✓)

6- (X) 7-(✓) 8-(X) 9-(X) 10-(✓)

Worksheet (3)

- **Write the scientific term :**

1. Sound energy 2.Light energy 3.Kinetic energy

- **Choose the correct answer:**

1. B 2.D 3.B 4.A

- **Complete the following sentences:**

1- Chemical – kinetic
2- Electrical – thermal
3- Conservation of energy

- **Give reasons for :**

1- Because the electrical energy is converted into thermal energy.
2- Because battery is the source of energy that is used to operate the toy car

- **What happens if…?**

- You feel warm .

Worksheet (4)

- **Put (✓) or (x) :**

1- (X)
2- (✓)
3- (X)
4- (✓)

- **Write the scientific term:**

1- Thermal energy 2.Thermal energy
2- Kinetic energy 4.Electrical energy

- **Choose the correct answer:**

1- A 2-C 3-C 4-a

- **What happens if…?**

1- The electrical energy is converted into kinetic energy.
2- Some energy is wasted as thermal energy .

- **Give reasons for:**

1- Because it doesn't help the mobile phone do its main function.
2- Because they don't help the blender do its main function .

Worksheet (5)

- **Correct the underlined words:**

1- Thermal energy 2-Thermal energy

- **Put (✓) or (x) :**

1- (✓) 2-(X) 3-(✓) 4-(X)

- **Choose the correct answer:**

1- B 2-C 3-D

- **Complete the following sentences:**

1- Thermal – kinetic 2-Coal- wood

- Give reasons for:

1- Because fuel burns inside the engine to produce the thermal energy that is changed Into kinetic energy.
2- Because the fuel in the car tank runs out.
3- To produce thermal energy which causes the car to move.

Worksheet (6)

- **Choose the correct answer:**

1. D 2.A 3.B 4.A 5.C

- **Complete the following sentences:**

1- Solar energy – renewable – natural gas 2-Liquid

3-Biofuel – fossil fuel 4-Non-renewable

- **Correct the underlined words:**

1- A small 2-The sun 3-Plants 4-Decreased 5-Biofuel

- **Put(✓) or (x) :**

1. (X) 2. (X) 3. (✓) 4.(X) 5.(✓)

- **Read the following paragraph, then choose the correct answer:**

1. a 2- a. 3- d.

Worksheet (7)

- **Put (✓) or (x) :**

1. (✓) 2. (X). 3.(✓). 4. (✓)

- **Arrange the following sentences:**

3 , 1 , 5 , 2 , 4

- **Write the scientific term:**

1. Water. 2. Fossil fuel. 3. Turbine

- **Correct the underlined words:**

1. Natural gas. 2. Renewable. 3. Steam. 4. Heat

- **Choose the correct answer:**

1. C. 2. D 3. B. 4. A. 5. D. 6. C.

Worksheet (8)

- **Choose the correct answer:**

1. B. 2. B. 3. A.

- **Complete the following sentences by using the words:**

1. Fish 2. Carbon dioxide. 3. Soil – acid 4. Smog

- **Write the scientific term:**

1. Respiratory system 2. Global warming

Worksheet (9)

- **Give one example for each other the following:**

1. Walking or biking. 2. Coal. 3. Not increasing the earth's temperature

- **Correct the underlined words:**

1. Non renewable resources. 2. Increase 3. Pollute.

- **Give reasons for:**
   1. Because when fossil fuel is burned it emits gases that cause air pollution
- **What happens if…?**
   1. The using of renewable resources of energy will not cause an increase in the earth's temperature
   2. Fossil fuel will run out on the earth .

Worksheet (10)

- **Choose the correct answer:**

  1. A. 2. B. 3. A
- **Correct the underlined words:**

  1. Solar 2. Low. 3. Electric.
- **Put (✓) or (x) :**

  1. (X) 2. (✓). 3. (✓). 4. (✓). 5. (X)

Worksheet (11)

- **Write the scientific term:**

  1. Photosphere. 2. Stars
- **Put (✓) or (x) :**

  1. (X). 2. (X). 3. (✓). 4. (C)
- **Complete the following sentences:**

  1. Plants. 2. Electrical – irrigation 3. Light – thermal
- **Give reasons for?**
  1. Because without sunlight plants will die ,and then animals that eat them will die also
  2. Because the atmosphere absorbs the sun's energy then land and water absorb this energy.

Worksheet (12)

- **Choose the correct answer:**

1. B. 2. D. 3. A. 4. D

- **Complete the following sentences:**

  1. Radiant – sun 2. Increase. 3. Electrical. 4. Kinetic – electrical

- **Correct the underlined words:**

  1. Kinetic. 2. Front. 3. Wind. 4. Move

Worksheet (13)

- **Choose the correct answer:**

  1. C. 2. A. 3. B

- **Correct the underlined words:**

  1. Electrical. 2. Electrical 3. Water

- **Put (✓) or (x) :**

  1. (X) 2.(✓). 3. (✓)
  2.

Worksheet (14)

- **Put (✓) or (x) :**

  1.(x) 2. (✓). 3. (✓). 4.(X)

- **Write the scientific term:**

  1. Water cycle 2. Evaporation

- **Choose the correct answer:**

  1. D. 2. D. 3. B

Worksheet15

1-Put () or ():

1- √ 2- √ 3-√ 4-x

2-Write the scientific term of each of the following:

1-Erosion of the sandcastle.

2-Canyons

3-Sandcastle

Worksheet16

1- Choose the correct answer:

1-a 2-a 3-d 4-c

2-Give reasons for

1-Due to the reaction between iron and oxygen of air.

2-Because water dissolves minerals in rocks, then this dissolved minerals combine again forming new shapes.

Worksheet17

1-Complete the following sentences:

1-mechanical 2-mechanical 3-chemical

2-Put (□) or (□):

1-x 2-√ 3-√

Worksheet18

1-Write the scientific term of each of the following:

1-Erosion 2-Deposition 3-A delta 4-A sand dune

2-Complete the following sentences

1-water 2-fall 3-plants-animals 4-wind

3- What happens when….?

1-The sedimentary rocks are formed.

2-A delta is formed.

Worksheet19

1-Choose the correct answer:

1-c   2-a   3-b   4-d

2-Put (□) or (□):

1-x   2-√   3-x

Worksheet20

1-Choose the correct answer:

1.b   2.c   3.c   4.a   5.c   6.b 7.b   8.a

2. Write the scientific term of each of the following:

1. canyon   2. Weathering and erosion processes

Worksheet21

1-Put true or false

1.(√) 2. (x) 3. (√)   4(x)   5(x)

2-Write the scientific term of each of the following:

1. Canyon   2. The grand canyon

Worksheet22

1. complete :

1.River   2. Speed   3. Deposition   4. Canyon   5-Silt _sand

2.Give reason for :

1.to learn about kind of living things existed there long ago

2.because they help in increasing the rate of deposition process

Worksheet23

1. choose the correct answer :

1.b 2.c 3.d 4.c 5.b 6.a

2.Put true or false

1.(√) 2. (√) 3.(x) 4(x) 5(x) 6(x)

Worksheet24

1 . complete

1.Sedimentary 2.Whales 3.Layers 4.Formation

2. Give reason

1. to know how the landscapes looked like in the past

2. because in the past a deep sea was existed at wadi alhitan